TRANSACTIONS

OF THE

LINNEAN SOCIETY.

VOL. VI.

RARE BOOK
QK1
L5642
1802
V.6

TRANSACTIONS

OF THE

LINNEAN SOCIETY.

VOLUME VI.

MISSOURI
BOTANICAL
GARDEN.

LONDON:

PRINTED BY WILKS AND TAYLOR, CHANCERY-LANE.

SOLD AT THE SOCIETY'S HOUSE, NO. 10, PANTON-SQUARE, COVENTRY-STREET,

AND BY JOHN WHITE, FLEET-STREET.

M.DCCC.II.

CONTENTS.

I. *A DISSERTATION on two Natural Genera hitherto confounded under the Name of Mantis. By* Anthony Auguſtus Henry Lichtenſtein, *D.D. F.M.L.S. Tranſlated from the German by* Thomas Young, *M.D. F.R.S. and L.S.* — Page 1

II. *The Botanical Hiſtory of the Genus Ehrharta. By* Olof Swartz, *M.D. F.M.L.S.* —— —— p. 40

III. *Account of a Microſcopical Inveſtigation of ſeveral Species of Pollen, with Remarks and Queſtions on the Structure and Uſe of that Part of Vegetables. By* Luke Howard, *Eſq. of Plaiſtow in Eſſex* —— —— p. 65

IV. *Obſervations on Aphides, chiefly intended to ſhow that they are the principal Cauſe of Blights in Plants, and the ſole Cauſe of the Honey-Dew. By the late Mr.* William Curtis, *F.L.S.* p. 75

V. *Remarks on the Genera of Pæderota, Wulfenia, and Hemimeris. By* James Edward Smith, *M.D. F.R.S. P.L.S.* p. 95

VI. *An Illuſtration of the Genus Solandra. By* Richard Anthony Saliſbury, *Eſq. F.R.S. and L.S.* —— p. 99

VII. *Obſervations on ſome remarkable Strata of Flint in a Chalk-pit in the Iſle of Wight, in a Letter from Sir* Henry Charles Englefield, *Bart. F.R.S. to John Latham, M.D. F.R.S. and L.S.* —— p. 103

VIII. *Re-*

VIII. *Remarks on ſome Britiſh Species of Salix. By* James Edward Smith, *M.D. F.R.S. P.L.S.* —— Page 110

IX. *Deſcriptions of four new Species of Fucus. By* Dawſon Turner, *M.A. F.L.S.* —— —— p. 125

X. *Deſcription of Callicocca Ipecacuanha. By* Felix Avellar Brotero, *Profeſſor of Botany in the Univerſity of Coimbra, F.M.L.S.* p. 137

XI. *Obſervations on the Curculio Trifolii, or Clover Weevil, a ſmall Inſect which infeſts the Heads of the cultivated Clover, and deſtroys the Seed. In a Letter to Thomas Marſham, Eſq. Tr. L. S. by* William Markwick, *Eſq. F. L. S. With additional Remarks by* Mr. Marſham —— —— p. 142

XII. *Further Obſervations on the Curculio Trifolii. In a Letter to William Markwick, Eſq. F. L. S. by* Martin Chriſtian Gottlieb Lehmann, *M.A. of Gottingen* —— p. 147

XIII. *Deſcription of Brotera perſica and Muſtelia eupatoria, two new Plants cultivated in the Botanic Garden of Halle, by* Curt Sprengel, *M.D. Profeſſor of Botany in the Univerſity of Halle* —— —— p. 151

XIV. *Obſervations on the Hinges of Britiſh Bivalve Shells. By Mr.* William Wood, *F.L.S.* —— —— p. 154

XV. *Catalogue of the more rare Plants found in the Environs of Dover, with occaſional Remarks. By Mr.* Lewis Weſton Dillwyn, *F.L.S.* —— —— p. 177

XVI. *Descriptions of some singular Coleopterous Insects. By* Charles Schreibers, *M. D. Deputy Professor of Natural History in the University of Vienna* —— —— Page 185

XVII. *Description of Menura superba, a Bird of New South Wales. By Major-General* Thomas Davies, *F.R.S. and L. S.* p. 207

XVIII. *On the Doryanthes, a new Genus of Plants from New Holland, next akin to the Agave. By* Joseph Correa de Serra, *LL.D. F.R. S. and L.S.* —— —— p. 211

XIX. *Observations on several Species of the Genus Apis, known by the Name of Humble-bees, and called Bombinatrices by Linnæus. By Mr.* P. Huber, *of Lausanne in Swisserland* —— p. 214

XX. *Botanical Characters of four New-Holland Plants, of the Natural Order of Myrti. By* James Edward Smith, *M.D. F.R.S. P.L.S.* —— —— —— p. 299

XXI. *Additional Observations on some remarkable Strata of Flint in the Isle of Wight, in a Letter from Sir* Henry Charles Englefield, *Bart. F. R. S. to John Latham, M.D. F.R.S. and L.S. of Romsey* —— —— p. 303

XXII. *Description of a new Species of Viola. By* Thomas Furly Forster, *Esq. F. L.S.* —— —— p. 309

XXIII. *Description of the Fruit of Cycas revoluta. By* James Edward Smith, *M.D. F.R.S. P.L.S.* —— p. 312

XXIV. *Species of Erica. By* Richard Anthony Salisbury, *Esq. F.R.S. & L.S.* —— —— Page 316

XXV. *Extracts from the* Minute Book *of the Linnean Society* p. 389

Catalogue of the Library *of the Linnean Society, continued from Page* 293 *of Vol.* V. *of the Society's Transactions* —— p. 391

List of Donors *to the Library of the Linnean Society* — p. 395

Directions for placing the Plates of the Sixth Volume.

Tab.		Page
1.	Phasma filiforme and Ph. hecticum, to face page	14
2.	Phasma Ohrtmanni and Mantis Filum	19
3. 4.	Flowers of Ehrharta	64
5.	Aphides, &c.	94
6.	Solandra	102
7.	Strata of Flint in Chalk	107
8.	Fucus ruscifolius, &c.	127
9.	Fucus clavellosus	133
10.	Fucus Wigghii	135
11.	Callicocca Ipecacuanha	140
12.	Brotera persica	151
13.	Mustelia eupatoria	152
14. 15. 16. 17. 18.	Hinges of Bivalve Shells	176
19. 20. 21.	Coleopterous Insects	206
22.	Menura superba	207
23. 24.	Doryanthes excelsa	213
25.	Humble-bees	230
26.	Nidification, &c. of Humble-bees	238
27.	The same	278
28.	Viola concolor	311
29.	Cycas revoluta	314
30.	A Frond, &c. of the same	315
31.	Cancer Phalangium	389

TRANS-

TRANSACTIONS

OF THE

LINNEAN SOCIETY.

I. *A Dissertation on two Natural Genera hitherto confounded under the name of Mantis. By Anthony Augustus Henry Lichtenstein, D. D. F. M. L. S. Translated from the German by Thomas Young, M. D. F. R. S & L. S.*

Read April 4, 1797.

WHEN I first took up Fabricius's System of Entomology, I was much struck with these words in the preface:—"The science of entomology is as yet in its cradle: it is scarcely so far advanced as botany was at the time of Cæsalpinus." I was then inclined to think that this gentleman, whose excellent moral character I have only since that time had an opportunity, by personal acquaintance, to know and esteem, had at least exaggerated the truth, and done injustice to Linné and the rest of his predecessors. But since I have had an opportunity of observing with accuracy, and of comparing with many descriptions and plates, a large number of insects, chiefly foreign, in the extensive collection of Mr. Holthuysen, I am convinced that this great systematist did not, in making that assertion, go much too far; for what a mass of information has been

added to our knowledge of insects within these twenty years by himself and other active naturalists! And yet we are still very far from having a proper natural arrangement and description of all the orders and genera. I shall say nothing of the species; for here, especially through the imperfection and frequent incorrectness of the synonyms, so much confusion prevails, that it is often difficult to ascertain to what species of Linné or Fabricius a perfectly common indigenous insect belongs. If a genus be truly natural, or, as logicians call it, a *genus proximum*, a single characteristic is almost always sufficient to determine with certainty to what species an individual of this genus is to be referred. The present attempt may serve as a specimen of the manner in which I conceive that still greater genera ought to be treated according to the natural distinctions; fixing the natural genera where the system has not already done it, and placing the species in order under appropriate subdivisions taken from essential differences; describing them with accuracy, and particularly adding the synonyms as completely and correctly as possible.

The idea of separating from the proper *Mantes* those species feeding on plants, that have no falciform fore-feet, but have all their legs formed for running, and making a new genus of them, is by no means of my invention. Caspar Stoll has already proposed it, but has not at all carried it systematically into effect. The splendid work which this zealous entomologist had begun to publish at Amsterdam in 1787 with a Dutch and French text, under the title of *Natuurlyke, en naar't leeven nauwkeurig gekleurde Afbeeldingen, en Beschryvingen der Spooken, Wandelnde Bladen, Zabelspringhanen, Krekels, Trekspringhaanen en Kakkerlakken*, in quarto, sold by J. C. Sepp, was interrupted by death, which cut off this gentleman (who, with many peculiarities, had yet undeniably great merit) in the middle of his career. Had he lived longer, this work on the *Ulonata* of Fabricius

would

would have been as claſſical as that for which we are indebted to him on the *Rhynchota*. He would thus have thrown light on all the *Hemiptera* of Linné, and have done as much as a ſyſtematic writer for this order of inſects, as Pallas has for the unguiculated quadrupeds among the *mammalia*. No one will deny, unleſs from an abſurd prejudice he deſpiſe every thing that is Dutch without further examination, that the late Stoll was a very diligent and fortunate obſerver. His penetrating eye, incredibly experienced and ready in diſtinguiſhing objects at firſt ſight, comprehended the whole habit ſo happily in one fixed point of view, that he diſcriminated the natural genera as if by internal feeling. The collection of Holthuyſen, which he had chiefly arranged, was divided almoſt univerſally into the ſame genera which Fabricius has adopted in his *Entomologia Syſtematica.* Stoll died before this work was publiſhed, and Fabricius ſaw that collection only curſorily in Hamburgh, when his book was all completed but the appendix. This agreement, therefore, between two perſons thinking quite independently of each other, ſhows clearly that entomology is not ſo uncertain and inconſtant as many believe; and that both of theſe gentlemen were in ſearch of truth, and knew how to find it. Syſtematical order, indeed, is not to be expected in the writings of Stoll; for, as he had no learned education, he was totally unprovided with that artificial logic which is more uſeful to men of letters in general than they often think proper to allow. Although the idea of this monograph was borrowed from Stoll, yet one acquainted with the ſubject will ſoon diſcover that I have not copied from him, but that I have beſtowed much labour of my own on this diſſertation.

I ſhall, in the firſt place, ſhow that the Spectre of Stoll, or the *Phaſma*, is truly different from the *Mantis*, and muſt be ſeparated from it as a diſtinct genus; in the next place, treat of both in general, going ſyſtematically through their ſpecies, and aſcertaining the ſynonyms;

then deſcribe at large the ſpecies omitted or newly diſcovered; and, laſtly, enumerate briefly thoſe which I cannot place under their proper genus, becauſe I am only acquainted with them from imperfect deſcriptions.

Stoll ſhows the eſſential difference between the two genera very correctly by the following compariſon of the parts and characteriſtics.

PHASMA. "Laubſchrecke."	MANTIS. "Fangſchrecke."
1. *Antennæ* ſetaceous with longiſh diviſions.	1. *Antennæ* filiform.
2. The *head* large and oval-round; the mouth with moveable jaws and four palpi.	2. The *head* nodding, heart-ſhaped, with jaws and palpi.
3. Small reticulated *eyes* on the forehead.	3. Two large prominent *eyes* on the ſides.
4. Three clear *ſtemmata* in a triangle between the eyes.	4. In moſt ſpecies two clear *ſtemmata* between the roots of the antennæ.
5. The *body* linear, almoſt cylindrical.	5. The *thorax* narrow, on the back ſomewhat carinated, at the margin compreſſed.
6. Six *legs* for running.	6. Six *legs*, the foremoſt with falciform hands, and a thumb of five joints at their ſide; the reſt ſlender and unarmed.
7. The *tarſi* conſiſt of five joints.	7. The *tarſi* have five joints.
8. The *hemelytra* [*deckflügel*] ſkinny, very ſhort, ſo that they ſcarcely cover a third part of the abdomen. The wings at the external margin membranous, about as long as the abdomen.	8. The *hemelytra* folded croſswiſe together, of the length of the wings beneath them, covering almoſt the whole abdomen.

Besides these distinctions taken from the different parts of the body, Stoll appeals, with reason, to the remarkable difference of the mode of life. His Spectres, which I name *Phasmata*, live solely on vegetable food. They lay their eggs, like grasshoppers, in the earth, the females being furnished with a small stile or instrument for depositing them, of an ensiform figure, and covered by three leaflets, which are found on the last division of the abdomen. The *Mantes*, on the contrary, confine themselves entirely to food taken from the animal kingdom; their falciform hands serving them to catch and carry to their mouths flies, and other insects, which they devour. As to what concerns their procreation and metamorphosis—they never lay their eggs in the earth, but fix them on a twig, straw, or blade of grass, and this in rows and regular masses, as Roesel has very correctly described. *Insectenbel.* pt. 4. p. 89. sq. and t. 12. Compare also *Merian. Surin. Ins.* p. 66. *Geoffr. Ins.* t. 1. p. 399. and *De Geer Ins.* pt. 3. p. 399.

It will not be superfluous to add some remarks which Stoll has omitted, and which set the difference between the two genera still more out of doubt. The antennæ of the *Phasmata* are situated on the sides of the head, far apart, and are inserted near the eyes: those of the *Mantes*, on the contrary, are placed on the forehead near together, between the eyes. The difference of the organs of feeding I shall explain more at large in the systematic description of the genera. The thorax, in the first subdivision or family of *Phasmata*, is always extended and cylindrical: sometimes set with little thorns, sometimes without thorns; but in the second family, which in general more resembles the *Mantes*, it is somewhat flattened, and almost marginated. The *Mantes*, on the other hand, have all a more or less carinated thorax: all those of the first family and some small species of the second family have a roundish thorax; but in most of the second

family

family it is marginated, and in the fore part extended more or lefs in breadth, but behind linear.

The abdomen in the *Phafmata* differs in different families. Thofe of the firft family have a rounded cylindrical abdomen, of ten nearly equal divifions, which, within its trifoliated extremity, contains a tail in which the parts of generation are concealed. The fecond family has the abdomen preffed flat, often even membranous, without any leaflets at the tail. In the *Mantes* the abdomen is very various, but always agrees with the character of the family.

The hemelytra of the *Phafmata* are often entirely wanting; when prefent they are membranous; in the firft family, efpecially in the males, they are very fhort, taper at the bafe, and toward the middle furnifhed with a fmall thorn, which is fometimes blunt, fometimes fharp. In the females they are moftly half as long as the wings, rounded off towards the tips, ribbed, and without thorns. In the fecond family the males have fhort and very narrow lancet-formed hemelytra; thofe of the females are broad, veined, and nearly of the length of the abdomen.

The *Mantes* have tranfparent thin hemelytra, with a broad, membranous, often grooved rib at the outer margin; which are feldom fhorter than the wings or abdomen.

The wings of the *Phafmata* are broad, inwards plaited and tranfparent, with a broad membranous rib at the outer margin, and fhorter than the abdomen. In fome fpecies of the firft family, and in the female of the *Phafma ficcifolium*, which is of the fecond family, and has very large and broad hemelytra, they are entirely wanting.

The *Mantes* have tranfparent, often colourlefs wings, more finely plaited, with only a narrow rib at the outer margin, and nearly of the

length

length of the abdomen. Only one ſpecies of this genus is entirely without wings.

The legs of the *Phaſmata* are all formed for running, and like to each other; the fore legs are placed ſo near to the head that they are excavated near the baſe to make room for the head between them. This is a very certain natural diſtinction, by which one may know whether even an imperfect ſpecimen is a *Phaſma* or a *Mantis*. The *Phaſmata* of the firſt family have very long and narrow fore feet, frequently with triangular and thorny legs. Thoſe of the ſecond family have ſhorter fore legs, with broad margins.

The *Mantes* have, inſtead of fore legs, arms, with nearly ſciſſor-formed hands; the upper arms and elbows are, according to the families, either narrowly or widely dentated or fringed. The four hind legs are for running; moſtly plain, more rarely adorned with foliated margins on the thighs, and ſtill more rarely on the tibiæ.

This compariſon ſhows ſufficiently that the *Phaſma* and *Mantis* are two very diſtinct genera.

Before I begin the ſyſtematic deſcription in the manner of Fabricius, I muſt ſpeak of the families or diviſions of the genera. The primary diviſions I have taken from Stoll. They depend in both genera on the rounded or more flattened ſtructure of the whole body, with which alſo the length of the fore legs agrees. The *Phaſmata* of the firſt family, that is the rounded ones, I divide again into wingleſs and winged; the flat *Phaſmata* require no further ſubdiviſion.

The *Mantes* of the firſt family, that is, (following the ſame order as in the *Phaſmata*, although Stoll takes them laſt,) the rounded ones, I divide into wingleſs and winged. The laſt again according to their eyes, which are either angular or round. The family of the flat *Mantes* may be ſeparated into two companies; the gouty ones, with leaves on their legs, and the round-legged ones, without them.

 Theſe

Thefe companies I divide, laftly, according to the eyes, each into two parties; of which the firft contains thofe with round eyes, the fecond thofe with angular eyes. This apparently trifling minutenefs or pedantry gives fo ufeful a thread to guide us to the determination of each fpecies of phafma or mantis that occurs, and makes it fo eafy to any one who will pay the leaft attention to inveftigate if and where fuch an infect has been defcribed, that I do not confider the time and trouble as loft which I have fpent on the difcovery of thefe fubtilties. True fyftematical proficients in entomology, who love truth and order, will richly repay this *laborem in tenui* by the approbation which they may be pleafed to beftow on it. I will not here attempt a prolix vindication of my having been obliged to alter entirely the defcription of the genus *Mantis*, and compofe new ones of *Phafma* and of *Mantis*, nor of the great difference frequently to be found between my defcriptions of the fpecies and thofe of Linné or Fabricius. True judges will themfelves difcover my reafons. Such as regard only authority I can affure, that Fabricius approves of my innovations. Amateurs and fharp-fighted obfervers, who are not fond of the technical and fcholaftic language, I refer to Stoll, whom I have accurately quoted; to Fûeflly's *Archives*, and to the Figures which I have here given; but efpecially to natural fpecimens. Perhaps many perfons will be reconciled to me on examining a well-ftored collection, who on the bare reading of the following Latin defcriptions will have fhaken their heads, or fecretly condemned me as an unauthorized pedantic innovator. In thefe infects the colours often deceive; partly becaufe they are frequently deftroyed by the fpirits in which the fpecimens had at firft been preferved; partly, becaufe the hemelytra frequently become fpotted from thin drops of pus being thrown out and adhering to them when they are ftuck through with pins. Hence, the *puncta fparfa elytrorum*, to which one muft never truft, unlefs they agree precifely on both hemelytra. *Sapienti fat.*

119—20 PHASMA.

119—20. PHASMA.

Palpi inæquales depreſſi; antici quadriarticulati; poſtici triarticulati, articulo extremo longiſſimo, ovato lanceloato.

Labium adſcendens bipartitum, laciniis fiſſis, pinnis æqualibus.

Antennæ ſetaceæ, articulis oblongis.

* *Teretia*, pedibus anticis longiſſimis tenuibus compreſſis.

† *Aptera.* Elytris aliſque in utroque ſexu nullis.

filiforme. 1. P. pedibus anticis inermibus longitudine corporis, antennis nigris.

Tab. I. *fig.* 1.

Mantis filiformis. *Fabric. entom. ſyſtem. t.* 2. *p.* 12. *n.* 1. *Mant. inſ.* 1. *p.* 227. *n.* 1. *Gmel. ſyſt. nat. p.* 2048. *n.* 1.

Small Braſil Quill Locuſt. *Petiver Gazoph. t.* 60. *f.* 2. *Browne Hiſt. of Jamaica, p.* 433. *t.* 42. *f.* 5.

Habitat in America auſtrali et inſulis oppoſitis. Muſeum Ohrtmannianum.

Sequenti adfine ſed multoties minus. Corpus et pedes fuſci teſtaceo annulati. Tarſorum articuli primores

---

Phaſmatis corpus filiforme ſubcylindricum (rarius abdomine depreſſo) glabrum, immarginatum, tardum: capite prominulo magno ovali, latiore quam thorax; oculis parvis reticulatis frontalibus; ſtemmatibus tribus lucidis, in triangulum intra oculos diſpoſitis; antennis diſtantibus lateralibus juxta oculos inſertis; thorace elongato lineari cylindrico, ſcutello nullo; elytris ovalibus parvis (in maribus minimis, baſi ſæpe ariſtatis) membranaceis; alis, coſta lata membranacea, hyalinis plicatilibus, rarius nullis; pedibus ſex, anticis capiti proximis juxta baſin intus emarginatis, omnibus curſoriis, tarſis quinquearticulatis; abdomine ſegmentis decem, ano laminis tribus partes ſexuales abſcondentibus.

 reliquis

reliquis æquales. Synonyma quæ prætermisi utique excludenda; præsertim *Herbst. arch. ins.* 8. *t.* 51. *f.* 2. quæ exhibet larvam alius speciei hujus generis.

Ferula. 2. Ph. pedibus aliquanto corpore brevioribus, tarsorum articulo primo triangulari erecto.

Mantis Ferula. *Fabric. entom. system. t.* 2. *p.* 12. *n.* 2.

Arumatia. *Marcgraf Brasil.* 251.

Roesel ins. 2. *Gryll. t.* 19. *f.* 10. *Stoll Mant. t.* 13. *f.* 51.

Habitat cum præcedente. Museum Holthuys.

Descriptio Fabricii accuratissime quadrat, nisi quod in nostro exemplari etiam anticorum pedum femora et tibiæ apice subspinosæ; item color non viridis sed fuscus testaceo annulatus. Forte quoniam in spiritu vini olim servatum.

cornutum. 3. Ph. pedibus anticis mediocribus tibiis omnibus muticis, capite oblongiusculo cornuto oculis prominulis.

Stoll Mant. t. 15. *f.* 57. *et* 57. *t.*

Habitat in America australi. Mus. Holthuys.

Corpus læve glabrum cylindricum, dilute fuscum; pedes elongati femoribus angulatis.

Calamus. 4. Ph. corpore virescente, femoribus striatis.

Mantis Calamus. *Fabric. entom. syst. t.* 2. *p.* 13. *n.* 3.

Habitat in insula St. Croix. Mihi haud visum.

Sceleton. 5. Ph. pedibus anticis elongatis, thorace cylindrico scabro postice attenuato, capite inermi oculis prominulis.

Stoll Mant. t. 14. *f.* 55.

Habitat in Sina. Mus. Holthuys.

Corpus magnum, elongatum, obscure testaceum. Antennæ setaceæ mediocres. Pedum tarsi articulo

primo

primo triangulari erecto. Adfine præter alarum defectum *Ph. necydaloides* cujus tamen vix larva.

latipes. 6. Ph. pedibus mediocribus foliato compressis.
Stoll Mant. t. 14. *f.* 54.
Habitat in Amboina. Muf. Holthuyf.
Corpus magnum, elongatum, lineare, teres, fuscum. Caput subrotundum; antennæ breves, oculi prominuli; ensis partumeius (sive cauda ensiformis) reflexus dentatus.

Plocaria. 7. Ph. corpore viridi, femoribus dentatis.
Mantis Rossia. *Fabric. entom. syst. t.* 2. *p.* 13. *n.* 4. *Rossi Faun. Etr.* 1. *n.* 636. *t.* 8. *f.* 1. mas.
Plocaria domestica. *Scop. delic. Insubr.* 1. *p.* 60. *t.* 24. *f.* A. 1—3.
Habitat in Italia. Mihi haud visum.

† † *Subaptera,* elytris, at alis nullis.

angulatum. 8. Ph. capite thoraceque spinosis, elytris rotundatis brevissimis, femoribus subtus angulatis.
Mantis angulata. *Fabric. entom. syst. t.* 2. *p.* 13. *n.* 5.
Mantis Gigas. *Drury inf.* 2. *p.* 89. *t.* 50.
Mantis gigantea. *Gmelin syst. nat. edit.* xiii. *p.* 2055. *n.* 49.
Habitat secundum Fabricium in Guadeloupe, secundum Gmelin in Italia superiori. Mihi haud nota.

† † † *Alata.* Elytris alisque in utroque sexu.

Gigas. 9. Ph. thorace teretiusculo scabro, elytris planis ovalibus nervosis, pedibus spinosis.
Mantis Gigas. *Linn. syst. nat.* 2. *p.* 689. *n.* 1. *Mus. Lud. Ulr. n.* 109.
Mantis Gigas. *Fabric. entom. syst. n.* 6. *Stoll Mant. t.* 2. *f.* 5.

Habitat in Amboina. Muſ. Holthuyſ.

Corpus magnum elongatum, ſupra cylindricum ſubtus complanatum. Caput erectiuſculum inerme ovale, paulo latius quam thorax. Antennæ ſetaceæ mediocres. Oculi parvi, frontales vix prominuli. Thorax antice, ubi pedes primores inſerti, ſubdepreſſus et glabellus; medio teres, granulis elevatis ſcaber; poſtice ad baſin elytrorum et alarum terminatus appendicula triangulari ſcutelliformi. Abdomen teres lineare ut in hac tribu ſemper. Elytra brevia, plana, ſpathulato ovalia repanda, nervoſa (item ut alæ maximæ,) obſcure teſtacea fuſco undata. Pedes elongati robuſti ſpinoſi dilutius teſtacei, fuſco annulati.

Omnia exemplaria mihi certe adhuc viſa ſunt ſexus feminini. Utrum *Phaſma hecticum* infra deſcribendum hujus *Ph. Gigantis* mas ſit nec ne, dies docebit; item utrum color naturalis vel in hac ſpecie ſit viridis.

Empuſa. 10. Ph. thorace tereti granulato, elytris brevibus ovatis medio gibbis dente elevato obtuſo, dilute teſtaceis baſi et apice fuſcis, pedibus ſpinuloſis.

Aubent. Miſcell. t. 65. *f.* 1. mala.

Stoll Mant. t. 1. *f.* 1. bona.

Habitat in India orientali. Muſ. Holthuyſ.

Proxime adfine antecedenti at diverſum forma elytrorum et coloribus. Exemplar Holthuyſianum Stollii archetypon eſt corpore fuſco, artubus dilute teſtaceis fuſco undulatis. D'Aubenton exhibet colorem totius inſecti virideſcentem, præter baſes apiceſque elytrorum, ut in noſtro, fuſcos. Forſan ideo, quod ejus exemplar numquam in ſpiritu vini adſervatum fuerat.

Quod

Quod vero idem pedes primores breviſſimos pingit; inde ſequitur, ut vel defuerint in exemplari Lutetiano, vel ſpurii fuerint adglutinati, vel denique ut chalcographus tabulæ anguſtiâ ſe viderit circumſcriptum. Quidquid id eſt, deformat iſthæc præternaturalis pedum brevitas omnem phaſmatis noſtri habitum.

nævium. 11. Ph. thorace cylindrico ſcabro, elytris ovatis angulatis, alis oblongis fuſcis hyalino feneſtratis.

α *Femina.* Mantis necydaloides. *Linn. ſyſt. nat.* 2. *p.* 691. *n.* 14. *Amæn. acad.* 6. *p.* 397. *n.* 3.

Mantis necydaloides. *Fabric. entom. ſyſt. t.* 2. *p.* 14. *n.* 7. *Roeſel inſ.* 2. *Gryll. t.* 19. *f.* 9. *Stoll Mant. t.* 3. *f.* 8.

β *Mas.* Mantis cylindrica. *Gmelin ſyſt. nat. edit.* xiii. *p.* 2048. *n.* 54. *Muſ. Leſk. p.* 46. *n.* 12. *Stoll Mant. t.* 4. *f.* 11.

Habitat in Amboina. Muſ. Holthuyſ.

Differt ab antecedentibus, craſſitie corporis baſi elytrorum multo anguſtiore et alis fuſcis hyalino feneſtratis. Mas in hac et ſequenti ſpecie (forſan pluribus quoque in hac tribu) multoties minor quam femina, ſed antennæ robuſtiores.

edule. 12. Ph. thorace tereti (maris ſcabro, feminæ glabro), elytris alarumque coſta læte viridibus, pedibus ſubmuticis.

α *Femina.* *Stoll Mant. t.* 6. *f.* 20. *Houttuyn natuurl. hiſtor. t.* 79. *f.* 1.

β *Mas.* Mantis phthiſica. *Linn. ſyſt. nat.* 2. *p.* 689. *n.* 2.

Mantis Jamaicenſis. *Fabric. entom. ſyſt. t.* 2. *p.* 15. *n.* 11. *Gmelin ſyſt. nat. edit.* xiii. *p.* 2054. *n.* 41. *Drury inſ.* 2. *t.* 49. *f.* 1. *Stoll Mant. t.* 6. *f.* 21.

Habitat in India orientali. Muſ. Dom. Holthuyſen.

Corpus

Corpus magnum, præsertim feminæ, quæ adeo crassior quam *Ph. Gigas*, et teste Valentino Malaiis pro cibo inservit. Cf. *Houttuyn. nat. hist. p.* 1. *vol.* 10. *p.* 138.

becticum. 13. Ph. thorace tereti scabriusculo, pedibus angulatis anticis latissimis tibiis dentatis, elytris brevissimis juxta basin spinosis, alis hyalinis fusco maculatis.

TAB. I. *fig.* 2.

Habitat in Sina. Mus. Dom. Holthuysen.

A Stollio non depictum. Ulteriorem descriptionem vide infra.

atrophicum. 14. Ph. thorace quadrispinoso, elytris brevissimis, basi aristato mucronatis.

Mantis atrophica. *Pallas spicil. zool. fascic.* 9. *p.* 12. *t.* 1. *f.* 7. *Fabric. entom. syst. t.* 2. *p.* 14. *n.* 8. *Gmelin syst. nat. p.* 2054. *n.* 38.

Habitat in Java.

Exemplar quod Pallas vidit et descripsit fuit mas. Femina adhuc ignota probabiliter est aliquoties major, elytris mediocribus ovali-repandis.

Umbretta. 15. Ph. thorace tereti scabro, elytris brevissimis basi aristato spinosis, alis longitudine abdominis.

Stoll Mant. t. 8. *f.* 27.

Habitat in Surinamo. Mus. Dom. Holthuysen.

Exemplar masculum. Color totius corporis obscure fuliginosus; alæ extus maculis oblongis fuscis. Antennæ concolores setaceæ longitudine corporis. Femina adhuc ignota.

roseum. 16. Ph. thorace tereti glabro, elytris lanceolatis, alis roseis costa viridi.

Mantis

Fig. 1 *Phasma filiforme*.
2 —— *hecticum*.

Mantis rosea. *Fabric. entom. syst. t. 2. p. 16. n. 15. Stoll Mant. t. 5. f. 17.*

Habitat in Amboina. Mus. Dom. Holthuysen.

Fabricius æque ac Stoll vidit exemplar masculum, sed meliùs siccatum ideoque viride. Femina adhuc latet.

laterale. 17. Ph. thorace teretiusculo glabro, pedibus inermibus, corpore nigro, elytris brevibus alarumque basi sulphureis.

Mantis lateralis. *Fabric. entom. syst. t. 2. p. 15. n. 12. Gmelin syst. nat. p. 2054. n. 42. Stoll Mant. t. 10. f. 36 et 37.*

Habitat in Indiis. Mus. Dom. Holthuysen.

Stoll quidem putat se exhibere ambos sexus, sed utraque figura videtur masculina; alioqui magnitudo et elytrorum figura in hac specie pro sexu parum variaret; quod certe contra analogiam hujus generis.

variegatum. 18. Ph. thorace tereti glabro, elytris brevissimis ovatis, alarum costa fusca, fasciis quatuor sulphureis.

Stoll Mant. t. 8. f. 26.

Habitat in Surinamo. Mus. Dom. Holthuysen.

Parvum. Antennæ setaceæ brevissimæ: alæ juxta basin hyalinæ, costa latissima. Abdomen subdepressum dilute fuliginosum. Alter sexus adhuc latet.

bimaculatum. 19. Ph. thorace tereti glabro, elytris brevissimis lanceolatis dilute fuscis, medio macula sulphurea.

Stoll Mant. t. 8. f. 29.

Habitat in Coromandel. Mus. Dom. de Breukeler Wærth.

Antennæ setaceæ longissimæ; corpus et pedes dilute fuliginosi. Alæ hyalinæ, basi rufescentes, costa dilute fusca. Femina adhuc latet.

cinereum. 20. Ph. thorace tereti glabro, elytris breviffimis lanceolatis cinereis fufco reticulatis, alis dilute cinereis fufco venofis cofta rufefcente.

Stoll Mant. t. 14. *f.* 56.

Habitat in Surinamo. Muf. Dom. Holthuyfen.

Parvum. Antennæ fetaceæ breves. Corpus cinereum. Femina adhuc latet.

valgum. 21. Ph. thorace tereti glabro, elytris breviffimis ovatis, alis hyalinis, femoribus anticis extrorfum divaricatis.

Stoll Mant. t. 13. *f.* 52.

Habitat in Sina. Muf. Dom. Holthuyfen.

Antennæ fetaceæ longiffimæ nigræ: Corpus parvum. Femina adhuc latet.

* * *Depreffa.* Abdomine lato depreffo; pedibus anticis brevibus, latis, depreffis; thorace brevi. (Hæc aliquanto fimiliora mantibus quam antecedentia teretia.)

Dracunculus. 22. Ph. thorace brevi depreffiufculo, mutico; elytris viridibus, apice rubris.

Stoll Mant. t. 18. *f.* 65. femina declarata.

t. 5. *f.* 18. feminæ pupa e Muf. Dom. Holthuyfen, rectius ad fequentem referenda.

Habitat in Indiis.

Antennæ mediocres fetaceæ, bafi craffiores, manifefto articulatæ, articulis oblongis depreffis. Alæ cinereæ fufco undatæ; cofta teftacea fufco maculata, apice rubra. Pedum anticorum femora late marginata membranacea.

Forfan Fabricii *Mantis aurita, n.* 13. eft hujus mas,

 dummodo

dummodo pedes antici membranacei; id quod ex deſcriptione parum elucet.

Ohrtmanni. 23. Ph. thorace brevi, teretiuſculo, ſub-biarticulato; elytris mediocribus ovato-oblongis; alis rotundatis, abdomine brevioribus; pedibus anticis latiſſimis, omnibus membranaceis, marginato-ciliatis.

TAB. II. *fig.* 1.

Habitat in Indiis. Muſ. Dom. Ohrtmann.

Antecedenti adfine ſed diverſum. Caput antice granulatum, poſtice ſpinoſum, ſpina ſeſquialtera longiore auriformi. Antennæ ſetaceæ longitudine corporis articulis oblongis depreſſis. Thorax granulatus. Abdomen elongatum cylindricum. Elytra juxta baſin integra, neque ut antecedentis emarginata. Alarum coſta concolor griſeo fuſca.

manicatum. 24. Ph. elytris breviſſimis, baſi denticulo elevato, femoribus anticis membranaceis.

Mantis linearis. *Fabric. entom. ſyſt.* 2. *p.* 16. *n.* 14.

Habitat in India.

Antecedenti proxime adfine atque ejus forte mas. Mihi ex ſola deſcriptione Fabricii notum.

citrifolium. 25. Ph. thorace brevi, antice depreſſo, poſtice obcordato denticulato, femoribus ovatis membranaceis, marginibus denticulatis.

Mantis ſiccifolia. *Linn. ſyſt. nat.* 2. *p.* 689. *n* 3.
Muſ. Lud. Ulr. n. 111. *Fabric. entom. ſyſt.* 2. *p.* 18. *n.* 24.
Roeſel inſ. 2. *Gryll. t.* 17. *f.* 4, 5. femina.
Edw. aves, t. 258.
Houttuyn nat. hiſt. p. 1. *vol.* 10. *t.* 79. *f.* 2. femina.

Stoll Mant. *t.* 7. *f.* 24. mas. *f.* 26. femina, *f.* 25. A. larva junior. *f.* 25. B. larva adulta. *f.* 25. C. pupa. Omnia ex Mufeo Holthufiano.

Habitat in Indiis.

Antennæ fetaceæ mediocres, manifefto articulatæ, articulis oblongis depreffis.

Mas minor, anguftior, alatus: elytris lanceolatis brevibus, viridibus, alis hyalinis, cofta marginali lata virefcente.

Femina major, lata, aptera: elytris oblongis venofo-reticulatis viridibus fere longitudine abdominis. Alarum rudimentis nullis.

Caput, antennæ, oculi, pedes in utroque fexu, item elytra et alæ in mafculis hanc fpeciem procul dubio generi *phafma* vindicant; licet uterque fexus corpore depreffo, femoribus membranaceis, et ãno fimplici; femininus vero præfertim elytris oblongis abdomen tegentibus naturalem tranfitum faciat ad Mantes.

120. MANTIS.

Palpi quatuor fubæquales, patuli, laterales teretes, filiformes; *antici* quadriarticulati, articulo extremo breviori acuto; *poftici* triarticulati, articulo extremo mediocri acuminato.

Labium

Antennæ frontales, approximatæ, plerifque filiformes in utroque fexu; rarius pectinatæ vel barbatæ.

* *Teretes.*

Mantis corpus elongatum, plerumque depreffum, glabrum, immarginatum, tardum: capite exferto, latiore quam thorax, cordato, declivi; oculis magnis, prominulis, lateralibus; ftemmatibus plerumque duobus lucidis, intra bafin antennarum; antennis intra

oculos

Fig. 1 Phasma Ohrtmanni.
2 Mantis filum.

* *Teretes.* Thorace fubæquali angufto, abdomine teretiufculo; pedibus anticis longiffimis fubteretibus, fpinofo-ciliatis.

† *Aptera.* Elytris alifque in utroque fexu nullis.

Filum. 1. Mantis corpore filiformi aptero, thorace tereti fubgranulato, abdomine depreffiufculo, brachiis fubcylindricis, pedibus curforiis fetaceis fimplicibus.

Tab. II. *fig.* 2.

Habitat in Surinamo. Muf. Dom. Holthuyfen, et Dom. Ohrtmann.

Corpus elongatum lineare, ut phafma filiforme, fed duplo minus: caput fubtriangulare, declive, latius quam thorax: antennæ filiformes breviffimæ; oculi rotundi laterales prominuli: thoracis pars antica verfus caput attenuata et fubincurva, quafi collum mentitur, poftica longiffima, haud manifefto ab abdomine fecreta: pedes antici per collum a capite remoti forma et ufu brachiorum ut in congeneribus: ulnarum apice fpinulis tribus. Pedes intermedii breviffimi, pofticique mediocres capillares teretes mutici. Cauda triphylla foliolis acuminatis. Color totius corporis obfcure teftaceus; oculi foli fufci.

---

oculos infertis: thorace obovato angufto (rarius ftrumofo), dorfo carinato, margine depreffo, fcutello nullo; elytris oblongis fubmembranaceis, bafi complicatis (dum finiftrum margine interno femper incumbit bafi elytri dextri, ut in locuftis Fabricii) longitudine alarum, rariffime nullis: alis plicatilibus fere totum abdomen tegentibus: pedibus fex; anticis brachiiformibus, qui conftant humeris, ulnis, manibus denique falcatis, pollice laterali filiformi quinquearticulato; reliquis pedibus intermediis nempe et pofticis plerumque teretibus muticis, rarius lobatis; tarfis quinque articulatis: abdomine plerumque ovato, depreffo, fubmarginato, rarius teretiufculo, fegmentis 8—10, ano fimplici. Victus e præda animali, quam manibus comprehenfam, ut fciuri ori admovent, devorant.

† † *Alatæ.* Elytris alisque in utroque sexu.

‡ *Dioptricæ*; oculis conico-acuminatis.

oculata. 2. M. corpore filiformi, thorace lineari subcarinato, elytris dimidio brevioribus quam abdomen.

M. bicornis. *Linn. syst. nat.* 2. *p.* 691. *n.* 11.
Mus. Lud. Ulr. n. 116.
M. oculata. *Fabric. entom. syst.* 2. *p.* 19. *n.* 26.
Stoll Mant. t. 10. *f.* 38.

Habitat ad Cap. bon. spei. Mus. Dom. Holthuysen.

Mantis fausta. *Fabric. entom. syst. n.* 47.
Thunberg nov. ins. sp. 3. *p.* 63.
Stoll Mant. t. 13. *f.* 53. vix ac ne vix quidem ab hac specie secernenda videtur.

Hottentottos hanc pro numine tutelari adorare pernegat Sparrmannus.

‡ ‡ *Boopides.* Oculis simplicibus, rotundis, prominulis.

leptelytra. 3. M. thorace lineari elongato, subdepresso, marginato; elytris angustis longitudine abdominis, hyalinis costa viridi; alis hyalinis, costa fusco maculata; apice dilute fusca.

Stoll Mant. t. 5. *f.* 16.

Habitat in Surinamo.

Antennæ mediocres filiformes, pedes graciles et, præter ulnas ciliatas, mutici.

purpurascens. 4. M. thorace lineari; elytris alarumque costa dilute fuscis; alis purpurascentibus, maculis quatuor cœruleis.

Stoll Mant. t. 8. *f.* 28.

Habitat in Surinamo.

Habitus

Habitus phasmatis sed certissime mantis. Sequenti adfinis attamen diversa.

picta. 5. M. thorace lineari, elytris alarumque costa et apice fuscis; alis hyalinis, juxta costam quinque maculis alternis, tribus purpureis, duabus dilute flavis.

Stoll Mant. t. 3. f. 9.

Habitat in Surinamo.

* * *Depressæ.* Thoracis basi vel medio latiore. Abdomine ovato depresso; manibus, femoribus tibiisque compressis; tibiis tarsisque anticis spinoso-dentatis.

† *Arthriticæ.* Pedibus lobatis.

‡ *Boopides.* Oculis simplicibus rotundis prominulis, thorace elongato filiformi.

gongylodes. 6. M. thorace antice dilatato dentato; elytris repandis costa viridi, longioribus quam alæ hyalinæ; femoribus anticis spina, reliquis lobo terminatis.

M. gongylodes. *Linn. syst. nat.* 2. *p.* 690. *n.* 4.

Mus. Lud. Ulr. n. 112. *Amœn. acad.* 1. *p.* 504.

Fabric. entom. syst. 2. *p.* 17. *n.* 17.

Aldrov. inf. t. 13. *f.* 21.

Marcgraf Brasil. 246. Gaayra.

Act. angl. 301. *t.* 20. *f.* 3.

Seb. mus. 4. *t.* 68.

Roes. inf. 2. *gryll. t.* 7.

Sulzer char. inf. t. 8. *f.* 50.

D'Aubent. misc. t. 65. *f.* 2.

Drury inf. 1. *t.* 50. *f.* 2.

Stoll Mant. t. 16. *f.* 58, 59.

Habitat

Habitat in Indiis. Muf. Dom. Holthuyfen.

Antennæ breves filiformes; capitis vertex fubulatus bifidus; ulnæ dilatatæ ciliatæ; femora introrfum lobo fimplici femicordato, extrorfum duplici aculeato, ftipitata; tibiæ teretes; elytra et alæ breviores quam abdomen.

flabellicornis. 7. M. thorace antice dilatato, fubbidentato; elytris repandis longitudine alarum; antennis pectinatis.

M. flabellicornis. *Fabric. entom. fyft.* 2. *p.* 16. *n.* 16. *Stoll Mant. t.* 17. *f.* 61.

Habitat in Indiis. Muf. Dom. Holthuyfen.

Proxime antecedenti adfinis. Differt modo antennis pectinatis; alis longioribus quam abdomen; et oculis minus prominulis. Lobi femorum exacte ut in M. *gongylode*. Quare olim forfan recte a Fabricio (*fpec. inf.* 1. *p.* 346. *n.* 8.) pro eadem fpecie habita eft.

pectinicornis. 8. M. thorace antice unidentato, elytris integerrimis hyalinis cofta viridi, alis hyalinis cofta fufca, antennis barbatis.

M. pectinicornis. *Linn. fyft. nat.* 2. *p.* 691. *n.* 10. *Amœn. acad.* 6. *p.* 396. *n.* 27. *Fabric. entom. fyft.* 2. *p.* 18. *n.* 25.

M. pennicornis. *Pallas it.* 2. *app. n.* 81. *Gmelin fyft. nat. p.* 2055. *n.* 53.

M. pectinicornis. *Herbft. arch. inf.* 8. *t.* 50. *f.* 2. *Stoll Mant. t.* 9. *f.* 34. mas. *f.* 35. femina.

Habitat prope mare Cafpium. Muf. Dom. Holthuyfen.

Mas multo minor, thorace mutico; femina thorace ciliato; antennis ulnifque latioribus. Femora in

utroque

utroque sexu solummodo gaudent introrsum lobo simplici semicordato subterminali. Tibiæ teretes. In synonymia fortasse passim confusio cum antecedente latet, ob neglectas elytrorum et femorum differentias.

lobipes. 9. M. thorace antice subdilatato mutico; elytris alisque hyalinis, costa striisque obliquis viridibus.

(M. undata. *Fabric. entom. syst.* 2. *p.* 19. *n.* 28. videtur hujus femina.)

Stoll Mant. t. 8. *f.* 30. mas.

Habitat in Tranquebar. Mus. Dom. Holthuysen.

Caput triangulare; frons producta in conum erectum; antennæ filiformes brevissimæ; oculi exserti. Brachia robusta manusque ut in tribulibus hujus generis femora et tibiæ utrinque lobis semicordatis stipitatæ; tibiæ item spina subterminali. Elytra et alæ aliquoties longiores quam abdomen. Fabricius in descriptione M. *undatæ* videtur usus fuisse femina hujus nostræ *lobipedis*, quæ colorum detrimentum cepit e spiritu vini.

mendica. 10. M. thorace antice marginato, ciliato; elytris albo viridique variis, costa guttis albis adspersa.

M. mendica. *Fabric. entom. system.* 2. *p.* 17. *n.* 19.

Stoll Mant. t. 12. *f.* 47.

Habitat in Africa boreali.

Caput triangulare, frons parumper producta, antennæ pectinatæ. Thorax pro hac tribu brevis. Femora sola introrsum lobo semiovato subterminali.

foliata. 11. M. thorace mutico, elytris viridissimis; posticorum pedum femoribus intus, tibiis utrinque lobatis.

Stoll Mant. t. 18. *f.* 67.

Habitat in Bengala.

Caput triangulare, frons parumper producta. Antennæ breves filiformes. Oculi exserti. Elytrorum basis interior, alæque hyalinæ. Pedes intermedii teretes.

pauperata. 12. M. thorace spinuloso; humeris extus spina, femoribus intus lobo semicordato terminatis.

Fabric. entom. system. 2. *p.* 17. *n.* 18. *Thunberg nov. inf. spec.* 3. *p.* 61.

Herbst. arch. inf. 8. *t.* 51. *f.* 1. femina.

Stoll Mant. t. 10. *f.* 40. mas.

Habitat in Coromandel.

Adfinis M. pectinicorni, at neutiquam ejus femina, namque est multoties minor. Differt præterea antennis in utroque sexu filiformibus brevibusque, thorace parum dilatato, elytris integerrimis viridibus flavo marginatis, et lobis intus modo ad femora adnatis.

bidens. 13. M. thorace scabro, elytris viridibus fasciis nigris, alis fuscis disco atro.

M. bidens. *Fabric. entom. syst.* 2. *p.* 22. *n.* 39.

Habitat in America.

Mihi solummodo ex Fabricii descriptione nota.

‡‡ *Dioptricæ.* Oculis conico acuminatis, thorace brevi lobato.

coronata. 14. M. thorace cordato, marginato; oculis oblongis porrectis; femoribus intus late lobatis.

 Stoll

Stoll Mant. t. 11. *f.* 44. *Ibid. f.* 44. item ejus larva.
Habitat in Amboina.

Antennæ filiformes mediocres. Quintuplo major quam ſequentes.

lobata. 15. M. thorace cordato marginato, elytris maculis binis quadratis albis.

M. lobata. *Fabric. entom.* 2. *p.* 23. *n.* 45.
Thunberg nov. inſ. ſpec. 3. *p.* 62. *f.* 73.
Stoll Mant. t. 12. *f.* 50.
Habitat ad Cap. bon. ſpei.

Sequenti ſimillima, at paulo major. Ulnæ anguſtæ ſubmuticæ.

naſuta. 16. M. thorace cordato ciliato, fronte porrecta ſpinoſo-emarginata.

M. naſuta. *Fabric. entom. ſyſt.* 2. *p.* 23. *n.* 44.
Stoll Mant. t. 9. *f.* 33. *et t.* 12. *f.* 48.
Herbſt arch. inſ. 8. *t.* 51. *f.* 4. Mantis tricolor. Pupa.
Habitat ad Cap. bon. ſpei. Muſ. Dom. Holthuyſen.

Antecedente paulo minor; abdominis margo lobato dentatus, lobis recurvis; brachiorum ulnæ latiores dentato ciliatæ.

† † *Eucnemides.* Femoribus tibiiſque ſimplicibus.

‡ *Boopides.* Oculis prominulis rotundis.

cancellata. 17. M. thorace dilatato, margine membranaceo plano; elytris ovalibus cancellatis.

M. cancellata. *Fabric. entom. ſyſt.* 2. *p.* 18. *n.* 23.
Stoll Mant. t. 11. *f.* 42.
Habitat in Surinamo.

M. Strumariæ adfinis, ſed differt: antennis breviſſimis, thoracis margine plano, elytris ovalibus ferrugineis fuſco cancellatis, medio macula ſubocellari teſtacea.

ſtrumaria. 18. M. thorace obcordato dilatato, margine ſubcucullato, elytris lanceolatis pellucidulis.

M. ſtrumaria. *Linn. ſyſt. nat.* 2. *p.* 691. *n.* 13.
Fabric. entom. ſyſtem. 2. *p.* 18. *n.* 21.
Merian. Surin. t. 27.
Seb. Muſ. 4. *t.* 69.
Roeſ. inſ. 2. *Gryll. t.* 3.
Stoll Mant. t. 12. *f.* 45.
Habitat in Indiis. Muſ. Dom. Holthuyſen.
Antennæ filiformes elongatæ.

precaria. 16. M. thorace elongato ſubciliato, elytris ovatis acuminatis vireſcentibus, ocello ferrugineo.

M. precaria. *Linn. ſyſt. nat.* 2. *p.* 691. *n.* 8. *Fabric. entom. ſyſt.* 2. *p.* 20. *n.* 32.
Merian. Surin. t. 66.
Seb. Muſ. 4. *t.* 67.
Houttuyn nat. hiſt. p. 1. *vol.* 10. *t.* 79. *f.* 3.
De Geer inſ. 3. *p.* 407. *n.* 3. *t.* 36. *f.* 4.
Herbſt arch. inſ. 8. *t.* 50. *f.* 1.
Stoll Mant. t. 17. *f.* 62.
Habitat in America. Muſ. Dom. Holthuyſen.
Antennæ filiformes mediocres; elytra ovata, acuminata; nunc ocello ferrugineo ſimplici, nunc dimidiato albo, nunc macula ſubocellari alba.

hodegetica. 20. M. thorace elongato ſubciliato; elytris ovatis acutis, viridibus immaculatis; alis hyalinis fuſco undatis.

M. carolina. *Linn. syst. nat.* 2. *p.* 691. *n.* 9. *Amæn. acad.* 6. *p.* 396. *n.* 28.

Habitat in Surinamo. Mus. Dom. Holthuysen.

Antennæ filiformes breves. Ulnæ intus macula magna atra.

irrorata. 21. M. thorace lævi subcarinato, elytris viridibus, punctis ferrugineis sparsis.

M. irrorata. *Linn. syst. nat.* 2. *p.* 690. *n.* 7. *Amæn. acad.* 6. *p.* 397. *n.* 29. *Fabric. entom. syst.* 2. *p.* 19. *n.* 29.

Habitat in America australi.

Antecedenti proxime adfinis, neque ab illa forsan tamquam peculiaris species diversa. Puncta sparsa elytrorum fortassis a sanie, dum insectum acu occideretur, emicante orta, ut in nostra *M. conspurcata.*

cingulata. 22. M. thorace elongato subciliato, elytris lanceolatis viridibus, nigro maculatis; alis nigricantibus nigro lineatis, costa ex fusco flavescente.

M. cingulata. *Gmelin syst. nat. ed.* 13. *p.* 2055. *n.* 48.

Drury ins. 2. *p.* 89. *t.* 49. *f.* 2.

Stoll Mant. t. 9. *f.* 32.

Habitat in America australi. Mus. Dom. Holthuysen.

Antennæ filiformes mediocres. Abdomen nigro cingulatum.

urbana. 23. M. thorace elongato subciliato, elytris ovalibus viridibus, fascia punctisque ferrugineis. *Fabric. entom. system.* 2. *p.* 23. *n.* 42. mas.

Stoll Mant. t. 9. *f.* 31. femina.

Habitat in Indiis. Muf. Dom. Holthuyfen.

Mas multo minor quam femina differt thorace integro.

Simulacrum. 24. M. thorace fubelongato, ciliato; elytris oblongis viridibus macula media alba.

M. Simulacrum. *Fabric. entom. fyftem.* 2. *p.* 21. *n.* 34.
Stoll Mant. t. 12. *f.* 49.

Habitat in Indiis. Muf. Dom. de Breukelerwærth.

Antennæ filiformes longæ; thorax paulo brevior et antice latior, quam in tribulibus.

obfecraria. 25. M. thorace elongato lævi; elytris fpathulatis hyalinis, cofta viridi; ocello rubro, dimidiato albo; alis hyalinis.

Stoll Mant. t. 18. *f.* 66.

Habitat ad Cap. bon. fpei. Muf. D. de Breukelerwærth.

Antennæ filiformes mediocres. Ulnæ intus macula nigra. *M. oratoriæ* adfinis, attamen diverfa.

oratoria. 26. M. thorace elongato lævi, elytris viridibus immaculatis.

M. oratoria. *Fabric. entom. fyft.* 2. *p.* 20. *n.* 31.
α mas. Mantis religiofa. *Linn. fyft. nat.* 2. *p.* 690. *n.* 5.
Roef. inf. 2. *Gryll. t.* 1. *f.* 1, 2.
Schæf. elem. t. 81.
Seb. Muf. 4. *t.* 67. *f.* 7, 8.
Stoll Mant. t. 5. *f.* 19.
β femina. M. oratoria. *Linn. fyft. nat.* 2. *p.* 690. *n.* 6.
Roef. inf. 2. *Gryll. t.* 2. *f.* 5. *item inf.* 4. *t.* 12.
Sulz. hift. inf. t. 8. *f.* 4.

De Geer

De Geer inf. 3. *p.* 410. *n.* 5. *t.* 37. *f.* 2. hic delenda, nam eſt *M. ſancta*, quod vel magnitudo docet.

Seb. Muſ. 4. *t.* 67, *f.* 9, 10.

Stoll Mant. *t.* 17. *f.* 64.

γ ſtriata. M. ſtriata. *Fabric. entom. ſyſtem.* 2. *p.* 20. *n.* 30.

Roeſ. inſ. 2. *Gryll.* *t.* 2. *f.* 6.

Habitat ubique in Zona torrida et temperata.

Mas antennis longioribus; thorace breviore. Femina alis apice viridibus.

conſpurcata. 27. M. thorace carinato ciliato, elytris ſpathulatis hyalinis, coſta ſubrepanda viridi, (punctis ferrugineis ſparſis.)

Stoll Mant. *t.* 16. *f.* 60. *ib.* *t.* 4. *f.* 12. pupa.

Habitat in Coromandel. Muſ. Dom. Holthuyſen.

Adfinis *M. oratoriæ*, at paulo major; antennæ filiformes mediocres. Thorax manifeſto ciliatus. Puncta ſparſa videntur a ſanie, dum occideretur, orta.

griſea. 28. M. thorace latiuſculo; oculis prominentibus; elytris aliſque griſeo hyalinis, fuſco maculatis.

M. griſea. *Fabric. entom. ſyſt.* 2. *p.* 22. *n.* 40.

Stoll Mant. *t.* 6. *f.* 23.

Habitat in Coromandel.

Statura mediocris. Caput quale Agrii virginis, at majus. Antennæ filiformes mediocres. Corpus artuſque griſei, fuſco punctati. Elytra oblonga, coſta ſubrepanda.

ochroptera. 29. M. thorace lævi, elytris oblongis teſtaceis, macula laterali fuſca.

De Geer inſ. 3. *t.* 36. *f.* 8?

Stoll

Stoll Mant. t. 6. *f.* 22. pupa? *t.* 4. *f.* 13. larva?
Habitat in Coromandel. Adhuc dubia species.

adsperfa. 30. M. thorace ciliato; elytris alisque longis griseis fusco maculatis.
Stoll Mant. t. 11. *f.* 41.
Habitat in Africa æquinoctiali.
Similis *M. precariæ*, sed minor. Elytra alæque oblonga integerrima.

hyalina. 31. M. thorace ciliato, elytris hyalinis margine viridi, fronte bidentata.
M. hyalina. *Fabric. entom. syst.* 2. *p.* 21. *n.* 37.
De Geer inf. 3. *p.* 410. *n.* 4. *t.* 37. *f.* 1.
Habitat in America.
Nimis adfinis videtur *M. oratoriæ.*

monacha. 32. M. thorace lævi, elytris alisque viridi hyalinis.
M. monacha. *Fabric. entom. syst.* 2. *p.* 21. *n.* 35.
Stoll Mant. t. 1. *f.* 2. mas.
Habitat ad Cap. bon. spei.
Similis *M. precariæ*, sed duplo minor.

sancta. 33. M. thorace serrulato, elytris viridibus immaculatis, alis hyalinis.
M. sancta. *Fabric. entom. system.* 2. *p.* 21. *n.* 33.
De Geer inf. 3. *t.* 37. *f.* 2. Mantis oratoria.
Habitat in Europa australi.
Similis *M. precariæ*, at triplo minor. Elytra oblonga integerrima. Alæ apice virescentes.

fasciata. 34. M. thorace subcarinato lævi; elytris oblongis integerrimis

rimis dilute fuſcis; alis cinereis fuſco undatis, faſcia lata purpurea juxta baſin hyalinam.

Stoll Mant. t. 18. *f.* 68.

Habitat in Surinamo.

Similis *M. purpuraſcenti*; ſed hujus tribus. Antennæ filiformes mediocres. Thorax elongatus vix marginatus, ſed ſubcarinatus nec linearis. Elytra alæque longitudine abdominis.

truncata. 35. M. thorace lævi; elytris integerrimis; alarum apice exalbido; abdomine depreſſo, margine lobato.

M. truncata. *Fabric. entom. ſyſt.* 2. *p.* 17. *n.* 20.

Stoll Mant. t. 3. *f.* 10.

Habitat in America auſtrali.

Parva ſed robuſta. Abdomen faſciis fuſcis cingulatum. Elytra puncto diſci fuſco.

neuroptera. 36. M. thorace lævi, antice tereti; elytris aliſque hyalinis, fuſco venoſis.

Stoll Mant. t. 12. *f.* 46.

Habitat in Ceylon.

Elytra et alæ fere, ut neuropteris v. c. Hemerobiis, longiores quam abdomen. Attamen certiſſime hujus generis et tribus.

Confer M. perſpicua *Fabric. entom. ſyſt. n.* 48. cui ſimillima præter maculas: item

M. parva *Gmelin p.* 2055. *n.* 47. *Drury inſ.* 2. *p.* 75. *t.* 39. *f.* 5.

caffrana. 37. M. thorace lævi, antice tereti, poſtice marginato; elytris viridibus, ſulphureo marginatis.

Stoll Mant. t. 11. *f.* 43.

Habitat

Habitat ad Cap. bon. spei.

Proxime adfinis *M. sanctae*.

prasinana. 38. M. thorace depresso, subcarinato, laevi; elytris brevibus acutis; alis abdomine longioribus nigris apice flavescentibus.

Stoll Mant. t. 1. *f.* 4.

Habitat in Surinamo.

Corpus parvum viride. Elytra brevia, medio linea elevata fusca, fere ut Phasmatis; sed caput, thorax et brachia Mantin arguunt. Pedes postici teretes tenuissimi.

minuta. 39. M. thorace elongato teretiusculo, elytris hyalinis costa virescente.

Fabric. entom. system. 2. *p.* 24. *n.* 50.

Stoll Mant. t. 2. *f.* 7.

Habitat in America australi. Mus. Dom. Holthuysen.

Parva. Caput cordatum oculis lateralibus. Antennae filiformes breves. Pedes antici a reliquis distantes capiti approximati. Elytra et alae viridi hyalinae.

pagana. 40. M. thorace teretiusculo, elytris alisque reticulatis albis, priorum costa macula laterali ferruginea.

Fabric. entom. system. 2. *p.* 24. *n.* 49.

Raphidia Mantispa. *Linn. syst. nat.* 2. *p.* 916. *n.* 2.

Raphidia stiriaca. *Pod. Mus. Graec.* 101. *t.* 1. *f.* 15.

Mantis Perla. *Pallas spicil. zool. fasc.* 9. *p.* 14. *t.* 1. *f.* 8.

Stoll Mant. t. 2. *f.* 6.

Habitat in Gallia, Germania.

Parva. Caput cordatum oculis lateralibus. Brachia capiti approximata. Thorax brevior quam antecedentis; vix carinatus, integerrimus.

pusilla.

pusilla. 41. M. thorace teretiusculo lævi, elytris alisque oblongis integerrimis hyalinis, priorum costa flavescente.

Fabric. entom. system. 2. *p.* 25. *n.* 51.

Pallas spicil. zool. fasc. 9. *p.* 15. *t.* 1. *f.* 9.

Stoll Mant. t. 1. *f.* 3.

Habitat ad Cap. bon. spei.

Parva, vix major quam *Raphidia Ophiopsis.*

nana. 42. M. thorace teretiusculo elongato, elytris alisque hyalinis fusco venosis, abdomine longioribus.

Stoll Mant. t. 4. *f.* 15.

Habitat in Coromandel.

Antecedenti adfinis, attamen diversa. Abdomen vix depressum; brachia capiti approximata. Corpus rufum; elytrorum costa angusta rufescens.

‡ ‡ *Dioptricæ*; oculis conico-acuminatis.

angulata. 43. M. thorace mediocri, elytris sinuato-repandis, abdomine lobato.

Stoll Mant. t. 4. *f.* 14.

Habitat in Surinamo. Mus. Dom. Holthuysen.

Corpus mediocre at robustum ferrugineum. Caput cornutum vertice bifido. Antennæ filiformes mediocres. Thorax cinereus subcarinatus elongatus lævis. Abdomen rufo-fasciatum, marginatum lobis ciliato-dentatis. Brachia ut in congeneribus. Pedes cursorii simplicissimi, lobis nullis; quum reliquæ Mantes depressæ dioptricæ omnes quoque simul arthriticæ reperiantur, vel hoc nomine, ut alioque species maxime singularis.

This may be sufficient for the nomenclature of the two genera which I have taken the liberty to name in German *Blattſchrecke*, or *Laubſchrecke*, and *Fangſchrecke*. It is unneceſſary to repeat here all that I have ſaid in Latin; I will only make a few general remarks, eſpecially on the ſpecies omitted by Fabricius. In the *Entomologia Syſtematica* we find in all 51 *Mantes*; I here deſcribe 25 *Phaſmata* and 43 *Mantes*, together 68 ſpecies; hence it might be concluded, that I had 17 new ſpecies; but this mode of reckoning is not perfectly ſure: it may be, and is, indeed, the fact, that I have added more than 17 ſpecies. The deſcriptions of Fabricius are very good and correct, but they are frequently inſufficient to determine to which family a *Mantis* belongs, and, therefore, I cannot always be certain whether this or that ſpecies delineated by Stoll, where I do not cite Fabricius, may not yet be found in the *Entomologia Syſtematica*. But this will be very rarely the caſe, and nearly all the ſpecies of Fabricius, which I paſs over in the monograph, are certainly wanting in Stoll.

Every one acquainted with the ſubject will obſerve, that the firſt 15 *Mantes* of Fabricius are one and all *Phaſmata*. A certain proof that the difference of the habit ſtruck alſo the attention of this ſharp-ſighted entomologiſt. The *Phaſma citrifolium* alone has gone aſtray among the *Mantes*, under the name of *M. ſiccifolia*, *n.* 24. This has been occaſioned partly by its belonging to a peculiar family, which has rather more reſemblance to the *Mantes* than the other *Phaſmata*, and partly from this circumſtance, that Fabricius was acquainted only with the female, and not with the male, which bears much ſtronger marks of a *Phaſma* than the female. Three ſpecies of *Phaſma* occur in Fabricius which Stoll has not, and which I have heſitated to number in the order of ſpecies. Not that I doubt their exiſtence, but becauſe they are males, and I cannot be certain that the female is not already reckoned among the ſpecies. They

are

are the following, *M. ſpinoſa, n.* 9. *M. biſpinoſa, n.* 10. and *M. aurita, n.* 13. This laſt is, in all probability, the male of the *Phaſma Dracunculus*, provided it has broad forelegs, and in general ſkinny margins on all its legs, which may eaſily be determined by inſpection of the Lundian collection in Copenhagen. The next in order, *Ph. lineare*, is certainly at leaſt of the ſecond family, and, probably, the male of my *Ph. Ohrtmanni*. The *Ph. ſpinoſum* and *biſpinoſum* belong certainly to the firſt family, and are very nearly related to the *Ph. atrophicum* and *hecticum*. The laſt mentioned are alſo males, of which the females are, perhaps, already known. In the genus *Phaſma*, the males in general are very clearly diſtinguiſhable from the females. The ſexual diſtinctions may be taken with the greateſt advantage from thoſe ſpecies of which the males and females are known with perfect certainty as belonging to each other. Theſe are particularly my *Ph. nævium* and *Ph. edule*. There are, indeed, ſome genera in which it ſeems that the difference of the ſexes in reſpect to magnitude is only obſervable in ſome ſpecies, and not in the genus at large. I need not go ſo far as to mention that in the genus *Cervus*, the ſtag, *Cervus Elaphus*, is greater than the hind; and, on the contrary, the roebuck, *Cervus Capreolus*, is conſiderably ſmaller than the doe; ſuch conſiderations would carry me too far from my purpoſe. I will confine myſelf to inſects. Here we have the *Bombyx diſpar*, in which an inequality exiſts between the two ſexes that may be called unexampled in this genus. It were uſeleſs to aſſert that there is a natural genus among the *Gloſſata* of which the ſexes are unequal in ſize, and which ought to be ſeparated from the genus *Bombyx*, in the ſame manner as the *Lucani*, where the ſexes are of unequal magnitudes, are ſeparated from the more proportionate *Paſſali*. Yet, ſetting aſide all theſe minutiæ, we may aſſume it as a probable hypotheſis, until the contrary be clearly proved, that the differences of moſt, if not of all, the other ſpecies of

Phafma, with refpect to fex, are analogous to thofe of the *nævium* and *edule*. This being granted, we may obferve that, 1. The males are always much lefs than the females. 2. Their antennæ are proportionably longer and thicker. 3. Their hemelytra are fmaller, round-oval, fharper at the tip, thorned at the bafe; thofe of the females larger, oval, rounded off at the tip, without thorns, but more ftrongly ribbed. 4. The females of fome fpecies are, perhaps, without wings, although they have hemelytra, and the males have really wings. The *Phafma citrifolium* of the fecond family, and the *Ph. angulatum* of the firft, afford examples of this. It is not impoffible that fome females may be found to want both wings and hemelytra, whofe males may have both. At the fame time, there are certainly fome males without wings in the perfect ftate. The *Ph. filiforme* in the Ohrtmannian collection is, without doubt, a male, full grown, and yet without any wings. Time will fhow whether or not this *Ph. filiforme* be the male of the *Ph. Ramulus*. 5. The head and thorax of the male *Phafma* are more thorny than thofe of the female. 6. The female *Phafmata* have, between the three leaves at the end of the abdomen, a proper fpine for laying eggs; the male organs, concealed in a fimilar pofition, are in dried fpecimens not to be clearly diftinguifhed. 7. The forefeet of the males are in proportion longer, thinner, and dentated with fewer but ftronger thorns.

Thefe obfervations may be of ufe in bringing together the fexes of the fame fpecies, and may ferve to guide and affift a reader, who has an opportunity of obferving thefe infects alive, to throw more light on their economy and procreation. But, on the other hand, they render difficult the determination of the fpecies. The fpecific characters ought properly never to be taken from the particulars juft mentioned, as they hardly ever agree perfectly in both fexes. I have fought as much as poffible to avoid this error in the defcription of

the

the ſpecies, of which I knew both the male and the female. Where I could aſcertain but one ſex, whether in a natural ſpecimen, or in a drawing or deſcription of good authority, I have been obliged, againſt my own principles, to form the ſpecific characters from thoſe variable diſtinctions which are ſubject to change with the difference of ſex. In this reſpect, therefore, whoever ſhall hereafter think proper to write a more complete and accurate monograph on the *Phaſmata*, will find ſtill much room left for corrections and improvements. I conſider myſelf as excuſed in the eyes of enlightened judges, as having been able to make uſe only of dried ſpecimens and books; and, beſides, as fairly confeſſing and pointing out the defects of my ſpecific characters, and recommending them to the improvements of thoſe who have opportunity of examining the living ſubjects.

In the genus of the proper *Mantes*, the difference between the two ſexes is far from being ſo ſtriking as in the *Phaſmata*. I believe that I have obſerved in ſome ſpecies the following ſexual characters, which I do not lay down dogmatically, but propoſe, as a critical reaſoner, to be brought to the teſt by thoſe who have opportunity and ſkill to make uſe of them. 1. The male *Mantes* are only a little ſmaller than the females. 2. Their antennæ are conſiderably longer, and ſomewhat thicker, ſometimes, although rarely, even pectinated. Thus, perhaps, the *M. flabellicornis* may be the male of *M. gongylodes*; on the other hand, both ſexes of the *M. pectinicornis* ſeem to have pectinated antennæ. 3. The males have proportionably larger eyes than the females; in reſpect to form and ſituation, the eyes of each ſex agree of courſe very exactly. 4. The thorax of the males is narrower, and, eſpecially at the margin, ſmoother. 5. Their abdomen is narrower and thinner. 6. Their hemelytra are narrower, and often longer. 7. Their wings are longer, and every way larger. 8. Their arms are ſomewhat longer; the upper and lower arm narrower, and leſs flattened; the ſciſſar-like, or falciform hand, narrower

 and

and longer; the thumb rounder and longer. The females are proportionately the reverfe in all thefe refpects, that is, the whole form is heavier, broader, flatter, and firmer. The proper organs of generation of the *Mantes* do not, in dried fpecimens, admit of examination.

From this digreffion on the fexual differences in both genera, I return to the account which I propofed to give.

In Gmelin's thirteenth edition of the *Syftema Naturæ* the *Phafmata* ftand as in Linné, intermixed with the *Mantes*. But we find fome enumerated amongft them that Fabricius has not. The *M. cylindrica*, *n.* 54. is doubtlefs the male of *M. necydaloides*. I have united both under *Ph. nævium*. *M. phthifica* is probably the male of my *Ph. edule*. *M. labiata* is alfo a *Phafma*, but I can fay nothing further of it. *M. gigantea* is our *Ph. angulatum*, as I rather choofe to call it after Fabricius; it is this fpecies defcribed from a female.

I now come to the proper *Mantes*. I muft here enumerate the following from Fabricius, which I have been obliged to omit, not being able to afcertain to which family they belong. 1. *M. fuperftitiofa* of that author, *n.* 27. appears to belong to the *Mantes* with a flattened body, rounded feet, and round eyes, and in my feries to come in between *M. ftrumaria* and *precaria*. 2. *M. feneftrata*, *n.* 38. appears to claim a place in the fame family and party. 3. *M. bidens*, *n.* 39. belongs to my arthritic divifion with round eyes, between *lobipes* and *mendica*. 4. *M. ruftica*, *n.* 43. muft, according to analogy, be alfo arthritical; and in that cafe it follows *M. pectinicornis*. 5. *M. faufta*, Fabr. *n.* 47. is fcarcely a fpecies effentially different from the *M. oculata*. 6. *M. perfpicua* muft be placed directly after my *neuroptera*.

The following *Mantes* of Gmelin I am quite at a lofs to arrange, as I have no fufficient accounts to enable me to afcertain their family and relationfhip with any certainty. 1. *M. maculata*, *n.* 45.

 2. *M. capen-*

2. *M. capenſis*, *n.* 46. 3. *M. anguſta*, *n.* 50. 4. *M. ſibirica*, *n.* 51. and 5. *M. brachyptera*, *n.* 52.

The new ſpecies, which I here deſcribe for the firſt time, with the addition of coloured plates, are the following:

1. *Phaſma hecticum*, TAB. I. *fig.* 2.
2. *Phaſma Ohrtmanni*, TAB. II. *fig.* 1.
3. *Mantis Filum*, TAB. II. *fig.* 2.

The *Phaſma hecticum*, which is an inhabitant of China, I deſcribe from a ſpecimen in the collection of Mr. Holthuyſen; it is of the male ſex, and reſembles the *Phaſma Gigas*; but does not ſeem to be the male of that ſpecies, although its female muſt be of the ſize of the *Ph. Gigas*.

The head is oblongo-ovate, highly vaulted, and covered with a ſhagreen-like ſkin. The forehead is elongated into a ſharp porrected horn, which is excavated in the middle with a deep furrow; the margins are bent round and ſerrato-dentated. It conſiſts of two leaflets, compreſſed from the ſides, which the inſect, when alive, can probably ſeparate at pleaſure from each other, and move either of them apart. The organs of feeding are of the ſame nature with the others of this genus and family. The eyes are ſituated under the forehead, and are ſmall, round, and black. The antennæ are ſetaceous, originate between the eyes, and have, at the baſe, two thick diviſions; the reſt are longiſh, and become, by degrees, narrower and narrower.

II. *The*

II. *The Botanical History of the Genus Ehrharta.* By Olof Swartz, M. D. F. M. L. S.

Read January 7, 1800.

AMONG the numerous botanical acquisitions made upwards of twenty years ago by Professor Thunberg during his extensive peregrinations in the southern part of Africa, was a kind of grass, whose difference from all before known, occasioned him to consider it as a peculiarly distinct genus. It was afterwards described and delineated by him in the Memoirs of the Swedish Royal Academy for 1779, *p.* 216. *t.* 8. under the name of *Ehrharta*, in honour of F. Ehrhart, native of Berne in Switzerland, once a pupil of the elder Linnæus, and His Britannic Majesty's botanist at Hanover; a man of great merit in the science of botany, and who is well known by his labours, particularly in the history of grasses and the cryptogamous tribe.

The same year this genus was adopted amongst the *Nova Graminum Genera*, arranged in a dissertation under the presidency of the younger Linnæus at Upsala.

In the mean time, the Abbé Rozier published in his Journal de Physique, 1779, *p.* 225. a botanical description made by L. Richard, of a kind of grass called by him *Trochera striata*, of which, notwithstanding the indifferent figure he has given, it is not difficult to perceive the near affinity with the former.

Several years afterwards the President of the Linnæan Society described in the first fasciculus of his *Plantarum Icones hactenus ineditæ*,

t. 9.

t. 9. a new species, under the name of *Ehrharta panicea*, detected in the year 1776 by Sonnerat, at the Cape of Good Hope.

In the second fasciculus of the same valuable work, the author enriches the genus *Ehrharta* with two other species, the *E. longiflora* and *E. calycina*, the latter of which had, some time before, appeared in the Linnéan *Suppl. Plantarum, p.* 108. where it is called *Aira capensis*.

But the great external similarity of this genus with that of *Melica*, has made me anxious to examine, with the leave of my highly esteemed friend Prof. Thunberg, into several of those species preserved in his museum, which we find not only inlisted in the *Suppl. Plant.* under the generic names of *Melica* and *Aira*, but even those inserted in the first part of his own *Prodr. Floræ Capensis*; and to my very great satisfaction, I have had the good fortune to detect some possessing all the characteristic marks of the genus in question. I am happy to acknowledge my high obligations to Prof. Thunberg, by whose generous communications I have thus been able to attain a tolerably complete knowledge of several beautiful kinds, which will still more help to settle the limits of this most distinct genus, and become so many cypresses round the urn of a man untimely lost for science, whose name will be preserved by them in the annals of botany.

Having now had the opportunity of studying and comparing so many species, I venture to offer more accurate characters to form the natural and genuine difference of the *Ehrharta* from other genera of the same natural order, the character hitherto given in the *Suppl. Plant.* and in the above-mentioned dissertation, being rather a specific description of the only species on which this new genus was first founded.

Habitus generis naturalis.

Radix fibrosa l. rarius bulbosa.

Culmi conferti, simplices l. subdivisi, subinde ramosi, articulati, subgeniculati,

niculati, erecti, l. verſus radicem decumbentes, ſtoloniferi; in quibuſdam ſuffruteſcentes.

Folia ut in gramineis baſi vaginantia, diſco plana, apice interdum convoluta; margine cartilaginea ſcabra l. crenulato-undulata.

Vaginæ arctæ, fauce contractæ, liguliferæ.

Panicula terminalis, ſimpliciuſcula, contracta l. patens.

Flores mutici l. ariſtati.

Glumæ calycinæ ſæpius coloratæ.

Character genericus.

CAL. *Gluma* uniflora, bivalvis.

Valvulæ corolla ſæpius breviores, ovatæ, acutæ, concavo-canaliculatæ, muticæ, patentiuſculæ, inæquales.

exterior plerumque minor, ovato-lanceolata, interiorem baſi amplectens.

interior parum major, lato-ovata, acuta.

COR. *Gluma* duplex, calyce longior, ſubclauſa.

Exterior bivalvis.

Valvulæ complicatæ, compreſſæ, amplexantes inæquales, ſæpe baſi uno alterove faſciculo villorum præditæ.

interior anguſtior, baſi utroque latere exciſa.

exterior latior, ante floreſcentiam maximam partem interioris obvolvens, infima baſi interiorem ſubtus (articulatione quaſi) excipiens.

Interior anceps, bivalvis.

Valvulæ complicatæ, membranaceæ, carinatæ inæquales.

exterior latior, baſi ad latera exciſa glumæ oppoſitæ corollæ exterioris illam amplectens.

interior ſubulato-falcata.

Ad baſin *interioris*, verſus valvulam interiorem glumæ corollinæ

exterioris

exterioris, insidet *tuberculum* sessile, subrotundum, inæquale; forsan rudimentum flosculi.

Nectarium. Petala s. membranulæ 2. minima, basi crassiuscula, apice tenuissima; genitalia obvolventia.

STAM. *Filamenta* 6. brevissima, circa germen inserta. *Antheræ* lineares, erectæ, basi emarginatæ, apice bifidæ, biloculares; *loculis* apice oblique hiantibus.

PIST. *Germen* ovatum, minutum, glabrum. *Styli* duo, brevissimi, erecti, contigui. *Stigmata* longa, conniventia, demum divergentia, compresso-bijubata.

PER. nullum; sed valvulæ coroll. persistentes includunt

SEMEN unicum glabrum.

Character essentialis.

CAL. *Gluma* bivalvis uniflora.

COR. *Gluma* duplex, utraque bivalvis; *exterior* basi excisa.

From the above generic character it appears—that the *glumæ corollinæ* being joined at the base by a kind of hinge or articulation, the interior of the exterior *corolline glumes* is emarginated at the sides of the base, or has on each side a semilunar cavity;—that a *rudimentum flosculi* is commonly found at the base between the two interior corolline valves; but in those species where this rudiment is wanting, a *squama petaloidea* is seen in its place on both sides, where the interior valve is emarginated;—that the filaments are not inserted in a parallel manner on two sides of the germen, but surround it; the *antheræ*, however, concealed within the compressed glumes of the corolla, are placed three on each opposite side of the *pistillum*;—that the *antheræ* open only at the top at the time of fœcundation;—and finally, that the *Styles* are invariably two, and the *Stigmata bijubata*.

This genus ought accordingly, in the ſexual ſyſtem, to take its place in *Hexandria digynia*, immediately after *Oryza*, it having been erroneouſly placed in the order *monogynia*; of this I ſhall have occaſion to ſay more hereafter. With reſpect to its natural order, it belongs to the *Gramineæ*, like the *Oryza*, *Zizania* and *Pharus*, with which it agrees in number of ſtamina,—a number unuſual among the graſſes.

As to the habit of the ſpecies in general, they approach particularly that of the *Melicæ*, although quite different in the number and the diſpoſition of the glumes.

The natural place of growth of this genus, as far as we yet know, is only near the ſouthernmoſt part of Africa, commonly called the Cape of Good Hope.

As there are ſpecies with *Ariſtæ* as well as without them, I have thought it moſt convenient in the following ſcientific deſcriptions, to divide the *Ehrhartæ* into *Muticæ* and *Ariſtatæ*.

* *Muticæ.*

1. EHRHARTA mnematea.

E. glumis corollinis exterioribus rugoſis obtuſis (muticis); panicula ſimplici laxa, culmo indiviſo; foliorum margine cartilagineo criſpo.

E. mnemateia, foliis vaginatis criſpis, corolla rugoſa obtuſa. *Thunb. prodr. fl. Cap. p.* 66.

E. capenſis, *Act. Holm.* 1779, *p.* 216. *t.* 8. *Nova plant. gen. Upſ.* 1779. *Linn. ſuppl.* 209. *Syſt. nat. ed. Gmel.* 1. *p.* 549.

E. cartilaginea, culmo indiviſo, panicula ſimplici, corolla exteriore retuſa ſubmutica, foliorum margine cartilagineo-criſpo. *Smith icon. plant. ined.* II. *t.* 32.

E. nutans. *Lamarck encycl. ſp.* 1.

DESCR.

DESCR. *Radices* filiformes, longæ, ſimplices, rigidæ, erumpentes ſub *bulbo* ſupra radicali glabro luteſcente, vaginis foliorum radicalium ſubimbricatis ſtriatis emarcidis tecto.

Culmus erectus, ſimplex, ſubbipedalis, remote articulatus (articulis circiter quinque) folioſus, craſſitie culmi *Triciti repentis.*

Folia inferiora s. radicalia longiora, palmaria, ſuperiora breviora, ſubenſiformia, erecta, marginata, margine cartilaginea, criſpa, l. crenulata, diſco læviuſcula, ſubtus nervoſo-ſtriata, baſi in vaginis contractis deſinentia, fauce reflexo nigro. *Ligula* minuta albida membranacea ciliata intra faucem inſerta culmumque cingens.

Panicula erecta, ſimplex, ſubflexuoſa; *pedunculi* bini ternique, laxiuſculi, capillares, inferiores 2—3 flori, ſub floribus incraſſati, ſæpeque colorati.

Flores magni, cernui, flavo-purpuraſcentes.

Calyx bivalvis.——*Valvulæ* ſubæquales, ſubovatæ, acutæ, concavæ, leviter carinatæ, patentes, membranaceæ, vix nervoſæ, totæ glabræ, dorſo et baſi fuſco purpuraſcentes. *Interior* paulo major latiorve, *exteriore* baſi amplexa.

Gluma corollina duplex, mutica, calyce longior.

Exterior acinaciformis, bivalvis.

Valvulæ complicatæ, compreſſiuſculæ, oblongo-lanceolatæ obtuſæ, baſi paullulum exciſæ.

exterior elongato-obovata, latior, carinata, dorſo leviſſime recurvata, lateribus inferne coſtatis et rugoſis, marginibus ſuperne ſubconvolutis; apice carinaque (oculo armato) ſcabriuſcula ſubhiſpida; faſciculis duobus villorum albiſſimorum extus baſin, unus ſupra alterum inſertis, ſæpe pallide violacea.

interior

interior anguſtior, linearis, acumine breviſſimo vix incurva, obtuſe carinata, tota rugis tranſverſis elevatis notata, margine ſubciliata, palleſcens; ad utrumque latus baſeos carinæ hiſpidulæ faſciculo villorum prædita.

Interior bivalvis.

Valvulæ inæquales, complicatæ, glaberrimæ, membranaceæ, pallide vireſcentes.

exterior ovato-lanceolata obtuſa, emarginata, dorſo imprimis carinata; nervoſa.

interior multo anguſtior, lanceolato-falcata, dorſo bicarinata, margine tenuiſſima, albida.

Inter baſin hujus et interiorem corollæ exterioris, *tuberculum* ſeſſile, minutum, inæquale.

Nectarium. Petala bina, minuta, obovata, erecta, baſi flaveſcentia, ſuperne tenuiſſima albida, margine lacero-ciliata, genitalia amplectentia.

Filamenta ſex breviſſima s. longitudine nectarii, circa baſin germinis inſerta, alba. *Antheræ* erectæ, lineares, longitudine glumæ interioris corollæ, baſi emarginatæ, apice bifido extrorſum pollen emittentes; luteæ.

Germen ovato-compreſſiuſculum, glabrum. *Styli* duo, filamentis breviores latiuſculi compreſſi, conniventes. *Stigmata* longitudine antherarum erecta, vix divergentia, compreſſo-bijubata s. pilis diſtichis longiuſculis albidoſplendidis ornata.

Semen ovatum, glabrum, glumis corollinis incluſum.

This beautiful graſs is diſtinguiſhed by its *acinaciform* or ſcymitar-ſhaped flowers, and its leaves being more cartilaginous and undulated at their edges than in any other known ſpecies. Though the culm is not ſo long as in many other ſpecies, the flowers ſurpaſs moſt of them in ſize. That the root, though provided with fibres, is at the ſame

time bulbous, is a circumſtance, I believe, hitherto not attended to. Truth obliges me alſo to declare that the *Ehrharta mnematea*, or *Capenſis*, is not monogynous, but really digynous. The miſtake, however, was eaſily made, becauſe the ſtyles are very ſhort, and the long ſtigmas in the compreſſed valves ſtick cloſe to one another, and appear as one, like a plume with four margins, and is called by Linnæus *quadrijubatum*, fourmaned; but on a nearer ſcrutiny, by the help of a pin, it may be divided down to the top of the germen.

Thunberg found this plant in the graſſy regions about *Swellendam*, and in other places at the Cape.

2. EHRHARTA panicea.

E. glumis corollinis exterioribus glabris ſubrugoſis obtuſis; panicula ſubramoſo ſecunda; culmo ſubdiviſo.

E. panicea, culmo diviſo, panicula ſubramoſa, floribus erectis digynis. *Smith pl. ined.* 1. *t.* 9.

E. erecta. *Lamarck encycl. ſp.* 2.

DESCR. *Radices* longiſſimæ, ſimpliciuſculæ, filiformes, fibrillis lateralibus brevibus, ex albido-fuſcæ.

Culmi cæſpitoſi, 1—2—3 pedales, geniculati, inferne decumbentes, ſubadſcendentes, ad genicula (præſertim inferiora) ſubdiviſi, quaſi ramoſi, tereti-compreſſiuſculi, glaberrimi, ſtriatuli, folioſi.

Stolones tereti-ſubulati albidi vaginati e radicibus ad baſin culmorum emiſſi.

Genicula majuſcula, glabra.

Folia 2—6 pollicaria et ultra, lineari-lanceolata, acuta, erecta, longitudinaliter ſtriata glabra; margine integra leviter undulata ſcabriuſcula, oculo armato cartilagineo-ſerrulates; juniora pubeſcentia, læte virentia.

Vaginæ

Vaginæ foliorum compreſſæ culmum arcte cingentes, *ore* membranaceæ ciliatæ; *ligula* albo-membranacea, ſemitubuloſa, laciniato-ciliata, intra faucem inſerta.

Paniculæ terminales, erectiuſculæ, laxæ, ſubramoſæ. *Pedunculi* capillares, ſuperiores ſimplices, erecti, alterni; inferiores terni ſecundi, quorum duo elongati, horizontaliter patulo-deflexi, *pedicellis* 1—2 linearibus, ſub floſculis incraſſatis, pubeſcentibus, unifloris.

Flores erecti, virides, polygami.

Calyx bivalvis. *Valvulæ* ovatæ, concavæ, ſubcarinatæ, obtuſæ, glabræ, virides, apice membranaceæ purpuraſcentes, exteriore majore.

Gluma corollina exterior mutica, calyce parum longior. *Valvulæ* complicatæ, oblongæ, concavæ, obtuſæ, compreſſiuſculæ, margine membranaceæ, dorſo (oculo armato) cartilagineo-ſerratæ baſi nudæ; ſubæquales. *Exterior* lævis, baſi triquetra; *interior* leviter coſtata, baſi pubeſcens nec villoſa, valde exciſa; lateribus inter coſtas tranſverſaliter rugoſis.

——*interioris* valvulæ complicatæ, carinatæ; *exterior* parum latior, glaberrima, 5-nervia, viridis, *interiorem* minorem, teneriorem, bicarinatam, albidam, amplectens.

Tuberculum minutum ovatum ad baſin inter valvulas corollinas interiores.

Nectarii petala duo minutiſſima, obovata retuſa erecta, plana integerrima, genitalia includentia.

Stam. 6. longitudine valvularum. *Filamenta* breviſſima. *Antheræ* lineares, baſi apiceque emarginatæ, biloculares, luteæ, apice extrorſum hiantes, polliniferæ.

Germen ovatum, glabrum, baſi attenuatum. *Styli* duo, ſta-

minibus breviores, divaricati. *Stigmata* albida, bijubata: pilis longis.

Semen oblongum, compreſſinſculum, baſi oblique attenuatum, glabrum, ſemidiaphanum; valvulis cor. incluſum.

Alii floſculi monoici, hermaphroditis in eadem panicula mixti.

Maſc. Piſtillum abortiens.

Fem. *Filamenta* longiſſima, capillaria abſque antheris, circa piſtillum fertile.

Dr. Smith deſcribed this ſpecies after a dried ſpecimen in the collection of his friend Thouin at Paris. Having myſelf cultivated the ſame for ſome years, it has been in my power to add a little to the ſpecific deſcription. From the manner of growing of this kind, as well as of others examined in the herbarium of Thunberg, it ſeems that, producing many ſhoots or runners from the roots, they form graſſy turfs. What has appeared to me moſt ſingular in the *E. panicea* is, that the lowermoſt peduncles of the panicle lean horizontally towards one ſide, or downwards. The flowers are, perhaps, the ſmalleſt of the genus. The lateral wrinkles (rugæ) of the exterior corolline valves alſo indicate an affinity to the foregoing, whoſe flowers they reſemble in form. Their likeneſs, however, to ſome of the *panicum* genus certainly juſtifies the ſpecific name given by Dr. Smith.

3. EHRHARTA ramoſa.

E. glumis coroll. exterioribus ſcabris retuſis; panicula coarctata; culmo ramoſiſſimo ſuffruteſcente.

Melica ramoſa, corollis glabris muticis, panicula coarctata, culmo ramoſo. *Thunb. prodr. p.* 21. *Sp. pl. ed. Wild. p.* 383.

MISSOURI BOTANICAL GARDEN.

Ehrharta digyna, foliis planis, corollis lævibus obtuſis coſtatis. *Ibid. p.* 66.

DESCR. *Culmus* 3—4-pedalis, erectus, glaber; inferne craſſitie pennæ anſerinæ, ſubſolidus, rigidus, ramoſiſſimus, ſeu ad articulos nodoſus, ubique dichotome ſubdiviſus, ramis teretibus ſubgeniculatis ſtriatis glabris vaginatis.

Folia inferiora vaginantia concava lanceolata, s. potius vaginæ inferiores bipollicares, culmum ramoſque baſi cingentes, uſque ad articulum apertæ, ſtriatæ, glabræ, virides.

Superiora, s. ramorum terminalium, linearia, apice erecto convoluta, baſi longiſſime et arcte vaginantia.

Paniculæ terminales, erectæ, coarctatæ, ſimplices, rarius ramoſæ, bi- tri-pollicares.

Pedunculi 2—4 lin. longi, 2—3, conferti, inæquales, uniflori.

Flores oblongo-lanceolati, obtuſi, erecti, albeſcentes, glabriuſculi.

Calycis valvulæ ſubæquales, ovato-lanceolatæ, acutæ, concavo-carinatæ, muticæ, glaberrimæ, nitidæ.

Gluma coroll. vix longior calycis, intra calycem pedicellata.

Exterioris valvulæ ſubæquales, carinatæ, lanceolatæ ſubretuſæ, lineis elevatis notatæ (coſtatæ Thunb.) oculo armato ſcabris, carinaque ciliata; albidæ, apice extimo plerumque fuſcæ; *exterior* faſciculo pilorum ad baſin dorſo inſerto; *Interior* baſi utroque latere valde exciſa, faſciculis pilorum duobus, ſquamuliſque ſemilunaribus minutiſſimis albidis lateralibus adpreſſis. (Forte rudimenta floſculorum.)

interioris valvulæ inæquales, glaberrimæ, carinatæ; *exterior* glumæ exteriori ſimillima, ſed tota carinaque glabra; *interior*

terior minor, tenerrima, acutiuſcula, diaphana, apice ſubciliata.

Tuberculum inter valv. inter. in hac ſpecie deeſt.

Nectarium: Petala cuneiformia, retuſa, integra, genitalia amplectentia, albida.

Filamenta 6, breviſſima. *Antheræ* lineares, minutæ, flavæ, apice pollen emittentes.

Germen ovatum. *Styli* duo, divergentes, glumis breviores. *Stigmata* congenerum, albida.

This kind is not leſs diſtinct in its flowers than in the rigidity of its branching culm, which, about the articulations, is almoſt ligneous. The panicles at the top of all the branches, being generally undivided, have more the appearance of *racemi.* The flowers ſomewhat reſemble thoſe of the *Feſtuca decumbens*, and are quite bare, with a calyx as long as the corolline valves, and frequently (not always) diſtinguiſhed by dark tips. Thunberg, probably induced by the outward reſemblance of the flowers, made this ſpecies a *Melica*; but being in poſſeſſion of another, though leſs perfect, ſpecimen, (which he did not ſuppoſe to be the ſame with his *Melica ramoſa*,) and having in that found the flowers correſponding with the character of *Ehrharta*, he again inſerted it in the *Prodr. fl. Cap.* under the appellation of *Ehrharta digyna.*

Thunberg met with this graſs in a valley diſtant from the Cape, called by the Dutch *Zoetemelks-valley.*

4. EHRHARTA melicoides.

E. glumis corollinis exterioribus glaberrimis obtuſis, panicula patentiſſima.

Melica Capenſis, corollis glabris muticis, panicula patentiſſima, foliis ſubfiliformibus. *Thunb. prodr. Cap. p.* 21. *Spec. plant. ed. Wild. p.* 383.

DESCR. *Culmus* erectus, inferne geniculatus, teres, ſtriatus, glaber.
Articuli pubeſcentes, albidi.

Folia linearia, acuta, longiuſcula, erecta, ſtriata, glabra, margine cartilagineo ſcabra. *Vaginæ* arctæ. *Ligula* ſubnulla.

Panicula erecta, pedalis, ramoſa.

Pedunculi patentiſſimi, ſubdiviſi, 3—4nis, capillares, purpuraſcentes; *pedicellis* tenuiſſimis longiuſculis laxis flexuoſis, ſub floribus incraſſatis, coloratis.

Flores ovati, *E. paniceæ* vix majores.

Calycis valvulæ æquales, dorſo obtuſe carinatæ, oblongæ, leviter acutæ, ſubnervoſæ, glaberrimæ, baſin verſus rubro s. violaceo-coloratæ.

Gluma corollina mutica, tota glabra, nitens, pallide virens.

Exterioris valvulæ oblongæ, obtuſæ, vix compreſſæ, dorſo convexæ, inæquales: *exterior* 3plo minor; *interior* magnitudine calycis, baſi excisa, cum ſquamulis lateralibus albidis.

Interioris valvula *exterior* magnitudine glumæ exterioris majoris, oblonga, obtuſa, glaberrima; *interior* minuta, lanceolata, tenerrima, albida.

Nectarii petala ſubrotunda, retuſa, albida ad latera germinis.

Filamenta 6, breviſſima. *Antheræ* lineares, longitud. coroll. interioris, flavæ, apice bifido polliniferæ.

Germen ovatum. *Styli* duo, breves. *Stigmata* priorum, albida.

This ſpecies has ſtill more reſemblance to a *Melica*, but the deſcription above ſhows its true genus. None of the former has ſuch bare and rounded corolline glumes. It diſtinguiſhes itſelf at firſt ſight by the very diffuſe panicles, more evidently ſubdivided than in the other kinds. There can ſcarcely be a doubt that this has been confounded with the following:

5. EHR-

5. EHRHARTA calycina.

E. glumis corollinis exterioribus ſubpiloſis obtuſis cum acumine brevi; panicula coarctata ſimpliciuſcula; culmo ramoſo.

E. calycina, culmo ramoſo, panicula ſubſimplici, calyce colorato corollam æquante. *Smith ined. faſc.* 11. *t.* 33.

Aira capenſis, culmo ramoſo, floribus racemoſis, corollis piloſis. *Linn. ſuppl. p.* 108.

DESCR. *Radices* capillares, filiformes, ſimplices, longiſſimæ.

Culmi cæſpitoſi, 2—3-pedales, ſubdiviſi vel ſubramoſi, inferne geniculati, teretes, glabri.

Folia linearia acuta, bi- ſex- pollicaria, erecta, ſtriata, margine ſcabra (oculo armato ſubciliata).

Vaginæ ſtriatæ, fauce coarctatæ, ſubinde ciliatæ; *Ligula* minuta, erecta, membranacea, albida, multifido-ciliata.

Panicula erecta, ſimpliciuſcula, coarctata, ſemipedalis; *pedunculis* binis, ternis s. quaternis, capillaribus, rectis, ſubſecundis, inferioribus 2—3—4-floris; pedicellis apice incraſſatis.

Flores erectiuſculi, plerumque purpuraſcentes, *E. paniceæ* duplo majores, plerique hermaphroditi, pauci feminei ſtaminibus carent.

Valvulæ calycinæ ſubæquales, longitudine fere corollæ, exteriore parum anguſtiore, lanceolatæ, obtuſe carinatæ, oblique retuſæ, ſtriatæ, ſcabriuſculæ vel glabræ, ſæpe violaceo s. pallide purpureo-coloratæ vel albidæ.

Valvulæ coroll. exterioris inæquales, carinatæ, extus piloſæ, obtuſæ ſubretuſæ cum brevi acumine. *Exterior* anguſtior, linearis, vix brevior; *interior* duplo latior, apice compreſſa, baſi parum exciſa, abſque villis, ſed ſquamulis minutiſſimis lateralibus.

Valvulæ interioris ſubæquales, carinatæ; *exterior* rarius piloſa; *interior* tenerrima.

Nectarii petala integra, rotundata, albida.

Filamenta 6. *Antheræ* erectæ, flavæ, utrinque bifidæ, apice polliniferæ.

Germen ovale, glabrum. *Styli* duo, breves. *Stigmata* pallida, bijubata, patula.

Semen oblongum, valv. coroll. incluſum.

Feminei in eadem panicula, quorum

Germen ſetis 4—6 longis rigidis albidis intra nectarium cingitur (forſan ſtam. ſterilia).

Varietas hujus ſpeciei occurrit:

Culmis filiformibus, foliis anguſtioribus.

Floribus albidis, minoribus.

Calycibus non coloratis, glabris.

Glum. cor. exter. valvula exteriore minuta, interiore obtuſa, inter pilos ſubruguloſa.

The deſcription is ſcarcely more than a copy of the very good one already given by Doctor Smith, and proves this plant undoubtedly different from the genus of *Aira*. By comparing ſeveral ſpecimens of the ſame, I have added ſomething to the illuſtration of the ſpecies. The exterior corolline glumes, though obtuſe, are uſually terminated towards the back in a very ſhort point, often ſcarce viſible to the naked eye. The colour of the calycine and corolline glumes is ſometimes alike in both, particularly in the variety above mentioned. The calyces are beſides more or leſs coloured in moſt of the ſpecies. The hairineſs of the corolline valves is alſo various, but always to be ſeen, at leaſt by the aſſiſtance of the microſcope. The pointed exterior corolline glume, the whole compreſſed *floſculus*, as well as the

the appearance of the panicle, make this kind very diſtinct from the *E. melicoides* juſt deſcribed.

Sterile male filaments are likewiſe found here as in the *E. panicea*, in ſeparate flowers from the hermaphrodite. Dr. Smith has alſo obſerved the ſame. There may, perhaps, be ſomething analogous in all the ſpecies of the genus, which for want of ſufficient ſpecimens could not at preſent be explored.

** *Ariſtatæ.*

6. EHRHARTA geniculata.

E. glumis coroll. exterioribus hirtis, altera mucronata; panicula coarctata; culmo decumbente geniculato.

Melica geniculata, corollis hirtis, panicula coarctata, culmo decumbente. *Thunb. prodr. p.* 21. *Spec. pl. ed. Wild. p.* 382.

DESCR. *Radices* longiſſimæ, filiformes, ſimplices.

Culmi 3—4-pedales, teretiuſculi, glabri, geniculati, inferne decumbentes, laxi.

Genicula tumida, fuſca.

Folia linearia, acuminata, plana, 4—6-uncialia, margine obtuſo cartilagineo leviter undulata, quaſi tenuiſſime crenulata, longitudinaliter ſtriata, glabra, ſupra glauceſcentia.

Vaginæ longitudine articulorum, tereti-compreſſiuſculæ, ſtriatæ, glabræ, arctæ, fauce nigricante ciliatæ; *ligula* albido-membranacea, lacero-ciliata.

Panicula erectiuſcula, coarctata, ſubramoſa, ſemipedalis, pedunculis ſubſecundis, pedicellis ſub floribus incraſſatis.

Flores oblongi, acuminati, erecti, exalbido purpuraſcentes.

Valvulæ calycinæ ovato-lanceolatæ, ſubacutæ, concavæ, muticæ, glaberrimæ, pallide purpuraſcentes; fere æquales.

Valvulæ

Valvulæ corollinæ exteriores calyce parum longiores, inæquales, carinatæ, albefcentes, hirfutie erecta tectæ. *Exterior* linearis, acuminata; *interior* dimidio major, bafi excifa, carina (oculo armato) ferrato-ciliata, *mucrone* (arifta brevi) fubulato fufco terminata.

Ad latera bafeos valv. inter. infident duæ *fquamulæ* fubrotundæ oppofitæ minutiffimæ albidæ.

Valvulæ coroll. interiores muticæ, glabræ, carinatæ. *Exterior* lato-lanceolata, apice obtufa, carina ciliata, flavefcens, margine tenui diaphana. *Interior* dimidio minor lanceolata acuta tenera alba.

Nectarii petala oblonga, erecta.

Filamenta 6, breviffima. *Antheræ* lineares, flavæ, pollen ex apice fundentes.

Germen ovatum, minutum. *Styli* 2. *Stigmata* alba, præcedentium.

This moft refembles the *E. calycina*; but, except a more geniculated difpofition of the culm, and the crifped edge of the leaves, as in the *E. mnematea*, the flowers appear to be longer. The calycine glumes equal in length with the corolla, which is more hairy than in the *E. calycina*. The exterior corolline glumes are alfo pointed, and one of them has a true, though fhort, *arifta*.

7. EHRHARTA longiflora.

E. glumis coroll. exterioribus rugofis hifpidis ariftatis; panicula laxiufcula ramofa.

E. longiflora, culmo fimplici, panicula ramofa multiflora, corolla exteriori mucronata tuberculato-hifpida, floribus triandris. *Smith ined. t.* 32.

E. ariftata,

E. ariſtata, foliis planis, corolla rugoſa ariſtata. *Thunb. prodr. p.* 66.
E. Bankſii, floribus digynis, corollæ gluma exteriori exterius hiſpida. *Syſt. nat. ed. Gmel.* II. *p.* 549.

DESCR. *Radices* ſimplices, filiformes.

Culmus ſimplex, bi-tripedalis, erectus, baſi ſubgeniculatus, teres, glaber.

Articuli fuſci.

Folia lanceolata, latiuſcula, erecta, pedalia, glabra, ſtriata, margine plana, cartilagineo-ſcabra.

Vaginæ carinatæ, laxiuſculæ, ſtriatæ, fauce contractæ, imberbes, fuſcæ. *Ligula* intra faucem, margine laciniato-ciliata, fuſca.

Panicula palmaris, ſubramoſa, multiflora.

Pedunculi inæquales, capillares, conferti, ſubverticillati, *pedicellis* ſub floribus incraſſatis, hiſpidulis.

Flores majores, lanceolati, ariſtati, pallide l. viridi-purpuraſcentes, nitidi.

Valvulæ calycinæ inæquales, 5-nerves, muticæ, pallide purpuraſcentes. *Exterior* minor, ovata, acuminata, ſubcarinata, margine anteriore ſerrulata; *interior* duplo major, ovata, concava, apice ſerrulata, acumine brevi terminali.

Valvulæ corollinæ exteriores calyce longiores, ariſtatæ, pallide virides, fere pollicares, ſubæquales, lanceolatæ, compreſſo-priſmaticæ, complicatæ, carinatæ, apice convolutæ in *ariſtam* ſubulatam, rectam, longitudine valvulæ, hiſpido-ſcabram; inter angulos verſus baſin tranſverſe rugoſæ, ſubinde læves, dorſo l. præſertim verſus apicem hiſpidæ, oculo armato tuberculatæ. *Exterior* faſciculo pilorum ad baſin unico; *interior* baſi exciſa, cum duabus ſquamulis lateralibus albidis.

Valvulæ corollinæ interiores minores, ovato-lanceolatæ, acutæ, carinatæ, muticæ, nervoſæ, glaberrimæ; interiore parum minore anguſtiore teneriore; dorſo ſubbicarinata.

Nectarii petala minutiſſima, ovata, ſuperne latiora, lacero-ciliata, albida.

Filamenta ſex, brevia. *Antheræ* oblongo-lineares, utrinque fiſſæ, apice extrorſum pollen fundentes.

Germen oblongum. *Styli* duo. *Stigmata* congenerum, parva.

This is one of the larger kinds, with a geniculated culm, broad leaves, and a much branched panicle. The flowers are remarkable for their pointed exterior corolline glumes, and their long *ariſtæ*. The glumes are often tranſverſally wrinkled, but not ſo much as in the *E. mnematea*. One of the calycine glumes is uncommonly ſmall. The number of the ſtamina I have, in all the flowers I examined, found to be really ſix, although Dr. Smith has ſeen only three. Accordingly, I have been doubtful whether or not the plants of Smith and Thunberg ſhould be conſidered as different; but having good reaſon to believe that the unnamed ſpecimen of *E. longiflora* in the Linnæan herbarium was communicated originally by Thunberg, and alſo finding his *E. ariſtata* coinciding with the deſcription of Dr. Smith's *E. longiflora*, it is moſt likely they are not different ſpecies. The particular diſtinction appears to conſiſt in the length of the *ariſtæ* and of the glumes, in the ſaid deſcription ſtyled only *mucronatæ* *.

8. EHRHARTA gigantea.

E. glumis corollinis exterioribus hirſutis ariſtatis; panicula coarctata ſubverticillata; *culmo* arundinaceo, foliis involutis.

* They appear to be one and the ſame ſpecies. Nothing is more variable than the length of *ariſtæ* in graſſes. *J. E. Smith.*

Melica

Melica gigantea, corollis hirsutis aristatis, panicula verticillata; culmo erecto. *Thunb. prodr. p.* 21. *Sp. pl. ed. Wild. p.* 382.

Aira villosa, foliis subulatis, panicula elongata angustata; flosculis sesquialteris hirtis aristatis; arista recta brevi. *Linn. suppl. p.* 109.

DESCR. *Radices* longæ, simplices, rigidæ, nudæ.

Culmus 6-pedalis, erectus, basi sublignosus nodosus, ad radices stolonifer, remote articulatus, teres.

Stolones cylindricæ radicantes crassæ, vaginis imbricatis striatis sericeis tectæ.

Folia semipedalia, remota, linearia, apice subulato-involuta, integra, erecta, striata, glabra, rigida, arundinacea.

Vaginæ arctæ, hirtæ s. pubescentes, fauce s. ad basin foliorum margine reflexo nigræ.

Panicula bipedalis, erecta, coarctata, subramosa, rachi apice subflexuosa.

Pedunculi capillares, conferti, subverticillati l. secundi, nigricantes, glabri; plerique simplices breves, 3—4 lin. longi, erectiusculi uniflori, uno alterove elongato 1—2-pollicari subdiviso 3—4-floro laxo; *pedicellis* sub flore incrassatis.

Flores subnutantes, rubro-flavescentes.

Valvulæ calycinæ lanceolatæ, acutæ, concavæ, dorso subcarinatæ, marginibus membranaceis oculo armato minute ciliatis, glaberrimæ, basi purpurascentes; *exteriore* vix majore sed latiore, apice minus acuto.

Corolla calyce duplo major, aristata.

Valvulæ exteriores lanceolatæ, concavæ, carinatæ, flavescentes, pilis longis albidis undique vestitæ, baseosque fasciculatis; apice *arista* subulata, erecta, nigra, oculo armato serrata, valvulis dimidio breviore auctæ, margine membranaceo involutæ;

involutæ; ſubæquales l. *interiore* paullo majore, infima baſi excifa.

Valvulæ interiores glabræ, muticæ. *Exterior* lato-lanceolata, retuſa, carinata, carina ſubciliata, breviſſime acuminata; *interior* minor, acuta, apice emarginata, tenera, alba, nitens.

Tuberculum minutiſſimum ad baſin inter valvulas interiores corollæ, ſeſſile.

Nectarii petala oblonga, baſi carnoſa lutea, ſuperne latiora, retuſa, margine crenulata, albida, radiato-venoſa.

Filamenta 6, filiformia, brevia. *Antheræ* lineares, flavæ, utrinque bifidæ, baſi obtuſæ, apice extrorſum polliniferæ.

Germen ovatum. *Styli* duo, lati, erecti, contigui. *Stigmata* longa, albida, cæt. conformia.

If the preceding deſerved the appellation of *longiflora*, this alſo merits the name of *gigantea*, being the largeſt known of its genus, and having the appearance of a reed. The flowers are in like manner proportionally large, and have, on minute inquiry, a ſtrict agreement with the generic character. They can by no means be united with the *Melicæ*, though the plant, as to the ramification and ſhape of the panicle, has ſome reſemblance to the *M. ciliata*. It cannot at all be compared with the *Airæ*, becauſe it has neither a *calyx biflorus* nor the habit of them. The interior corolline valves have probably been miſtaken for the ſuperfluous floret. The different colour and figure of the *ariſta* ſuggeſts the idea of ſuch a floret more than in the other ſpecies, notwithſtanding its ſhortneſs. The calycine glumes are ſtained with purple or brown, and are two-thirds the length of the corolla, which abounds with ſhining hairs.

9. EHRHARTA bulboſa.

E. glumis coroll. exterioribus obovatis emarginatis rugoſis ariſtatis; panicula ſimplici laxa.

E. bulboſa,

E. bulbosa, culmo indiviso, panicula ramosa multiflora, corolla exteriori retusa ariſtata. *Smith ined. faſc.* 11.

Trochera ſtriata, culmo enodi, foliis glabris, pedicellis paniculæ plerumque unifloris, valvulis exterioris corollæ tranſverſim ſtriatis, baſi papposis ariſtatis. *L. Richard in Rozier Journ. de Phyſ. v.* 13. *p.* 225. *t.* 3.

DESCR. *Radix* . . . . bulboſa.

Culmus erectus, pedalis & ultra.

Folia lanceolata, linearia, glabra.

Panicula erecta, laxiuſcula, ſimplex, 2—3-pollicaris. *Pedunculi* 3—5-ni, capillares, patentes, inferiores 2-flori longiores, ſuperiores ſenſim breviores, uniflori.

Flores pallide luteſcentes.

Valvulæ calycinæ ovatæ, acuminatæ, patentes, 2—6-lin. longitudine, membranaceæ; *interiore* parum majore.

Valvulæ corollinæ exteriores ſubæquales, s. interiore vix minore, calycis multo majores, complicatæ, carinatæ, obovatæ, baſi anguſtiores exciſæ, faſciculis albis villorum præditæ, apice latiores, obtuſæ, emarginatæ, *ariſtam* ſeſquilinearem erectam in emarginatura inſerentes, *rugis* tranſverſis elevatis notatæ, pubeſcentes.

Valvulæ interiores inæquales, compreſſæ, acuminatæ; *interiore* minore.

Nectarium ut in cæteris.

Filamenta tria ? ? *Antheræ* oblongo-lineares, apice bifidæ.

Germen oblongum. *Styli* 2, capillares. *Stigmata* villoſa.

This bears the ſame trivial name that Dr. Smith, probably on account of the root, has given it; I have, however, already proved that the root is not bulbous in this ſpecies only. The *E. mnematea* and

and *bulboſa* are neareſt related; they have both their exterior corolline glumes much wrinkled, but the latter is very diſtinct becauſe of its *ariſtæ*. The deſcription is a copy of Monſ. Richard's, made from a living ſpecimen out of a garden in France. He attributes to it only three ſtamina, which I will not diſpute, but ſhould wiſh for a further inquiry when the plant comes under future conſideration. The figure given by the author, though not good, gives an idea of the real ſpecific difference.

HAVING thus endeavoured to illuſtrate all the known *Ehrhartæ*, it may not be improper to add conciſe deſcriptions of the remaining two Cape *Melicæ* mentioned by Profeſſor Thunberg in his *Prodromus*, in order to ſhow that they are true ſpecies of *Melica*, and not to be referred to the above genus, leſt it ſhould be ſuppoſed there were no real *Melicæ* in that part of the world.

MELICA decumbens.

M. corollis hirſutis, floribus racemoſis nutantibus, culmo decumbente. *Thunb. prodr.* 21. *Sp. plant. ed. Wild. p.* 382--4.

DESCR. *Culmus* decumbens, teres, ſubfiliformis, glaber. *Genicula* glabra.

Folia conferta, baſi ſubimbricantia, erecta, lanceolato-linearia, apice involuto-ſubulata, glabra. *Vaginæ* ſtriatæ.

Flores racemoſi, ſecundi, pedicellati, ſemipollicares, nutantes in *racemo* terminali, erecto, bipollicari, indiviſo.

Calyx bivalvis.

Valvulæ ovatæ acuminatæ carinatæ, ſtriatæ, nervoſæ, glabræ, membranaceæ, flaveſcentes, baſi purpuraſcentes; exterior triplo minor.

Glumæ corollinæ bivalves, ſubæquales, extus, baſi imprimis, ſericeo-albidoque villoſæ.

Floſculus unus ſeſſilis, alter breviter pedicellatus.

Filamenta tria.

Rudimentum tertii floris, s. floſculus minutus, neuter.

MELICA racemoſa.

M. corollis hirtis, racemo ſubpaniculato floribus cernuis. *Thunb. prodr.* 21. *Sp. pl. ed. Wild. p.* 382—5.

DESCR. *Culmus* bipedalis erectus, teres, glaber, craſſitie *Melicæ altiſſimæ.*

Articuli glabri.

Folia linearia, erecta, apice involuta, glabra, ſtriata. *Vaginæ* ſtriatæ.

Racemus ſubpaniculatus, erectus, ſpithameus, ramis paucis brevibus.

Flores pedicellati, ſubſecundi, cernui, magnitudine *M. ciliatæ*, cui ſimillimi glumis calycinis & corollinis & numero ſtaminum.

EXPLA-

EXPLANATION OF THE FIGURES.

TAB. III. and IV. reprefent the flowers of all the foregoing fpecies of *Ehrharta.*

a A flower of the natural fize.

b A flower magnified.

c The calycine valves magnified.

d Both the corolline glumes, without the calycine valves, magnified, with the genitals within.

e The interior corolline valves, except in *E. mnematea,* where the exteriors alfo are reprefented.

f k The male and female parts, or the female alone, together with the membranous nectary, all magnified.

g A filament with the *anthera* opening at the top, magnified.

h The feed in *E. panicea* magnified.

i The fame of its natural fize.

1 *Ehrharta mnematea* Linn. trans. VI. Tab. III. p. 64.

G. Queiroz Sculp.

5 *E. calycina*

6 *E. geniculata*

7 *E. longiflora*

8 *E. gigantea*

9 *E. bulbosa*

G. Queiróz sculp.

III. *Account of a Microscopical Investigation of several Species of Pollen, with Remarks and Questions on the Structure and Use of that Part of Vegetables. By Luke Howard, Esq. of Plaistow in Essex.*

Read March 4, 1800.

IN the Spring of 1795, having much leisure, I devoted a portion of it to the examination of various minute productions of Nature in a good compound microscope. These researches would probably have terminated in present information and amusement only, but that they were accidentally turned to the pollen of flowers, respecting which, as a botanist, I found an inclination to inform myself, by comparing the several species together.

I began my observations with the Hazel-tree, *Corylus Avellana.* On a calm dry day I shook off some of the pollen from the expanded catkins upon a clean piece of writing-paper. I also gathered some of the catkins and female buds. These I viewed separately on a clear plate of glass, usually transmitting the light through them from a speculum below, and with different magnifying powers, preferring those which, without enormously enlarging the objects, gave a clear view of the structure and position of several at once. As I pursued this method with the rest I examined, I mention this to save repetition, and shall give the appearances from notes made at the time.

1. *Corylus Avellana.* Anthers furnished with transparent horn-like appendages. Pollen crumbles from the surface, and is sometimes so abundant as to fall in a visible cloud on the slightest motion

of a branch. To the naked eye it is a fine yellow powder. A few grains laid on the glaſs plate and viewed with the lens No. 4, ſome appear of an irregular angular ſhape, opake, except in one or two parts, where light paſſing preſents the appearance of a perforation; others nearly ſpherical, the ſurface divided by depreſſed lines into a number of convex facets. The tranſparency of theſe is ſuch, that they reflect the image of a ſmall object held under them, as well as a drop of liquid. On repeating the examination, the former are found to come from the moſt mature anthers, and to differ from the latter only as a raiſin does from a grape.

A clear drop of diſtilled water being put on the glaſs, both kinds imbibe it with the avidity of a ſponge; at the ſame time diſtending and ſpreading abroad in the water, but without any motion further than that which this expanſion cauſes. When ſaturated with water they remain at the bottom, clear as the liquid itſelf, and all alike diſtended to a bulk many times greater than their original one in the dry ſtate. They are now ſeen to be multilocular capſules, having ſepta in various directions within them, the union of which with the external membrane appears at the angles in the dry ſtate, and at the depreſſed lines in the wet.

Theſe capſules may be kept in the water for ſeveral days without any further perceptible change. When that is dried up they return to the opake ſtate, and the ſame operation may be ſeveral times repeated on them.

In exhibiting this ſpectacle to ſome friends, pure water not being juſt at hand, a drop of brandy was ſubſtituted for it. This gave riſe to a phænomenon equally curious and unexpected. The grains expand, as in water; but in the mean time they are put into rapid motion, each grain darting from ſide to ſide with the vivacity of a ſwarm of gnats in the air. As they approach to complete expanſion the motion dies away, and one after another ſinks to the bottom.

By

By a ſmall addition of freſh brandy ſome few are excited a ſecond time, but with fainter movements. Preſently the liquid begins to be obſcured, and in a few minutes the grains are moſtly diſperſed and decompoſed, and the ſpirit, exhaling, leaves a ſort of extract on the glaſs mixed with very minute undiſſolved particles; among which ſometimes appear a few unbroken grains, much changed, and now reſembling an empty bladder lying flat.

2. *Erica carnea.* Anthers capſular, bearing the pollen on their inner ſurface, and diſcharging it by a briſk exploſion from an aperture on the ſide next the piſtil. If the *ſtigma* be touched with a pin at a certain period of the infloreſcence, it happens commonly that all the anthers project their pollen at once; and it may thus be collected on paper. The proper time for this is when the *ſtigma* is elevated a little from between the anthers. In ſize and ſtructure this pollen nearly reſembles the preceding, and is, in like manner, capable of imbibing water and diſperſing with a rapid motion in ſpirit.

3. *Reſeda odorata.* Mignonette.

Unripe pollen, ſmooth, egg-oblong, tranſparent, without ſepta? In water it expands to a ſphere, and is acted upon by ſpirit as the preceding.

4. *Cactus flagelliformis.* Creeping Cereus.

Anthers oblong, crumbling. Pollen of a large ſize, compared with any others I have ſeen; in ſhape reſembling a plump grain of wheat, white and diaphanous. It expands in water to a ſhape nearly ſpherical. The contact of ſpirit brings on a pearly opacity. The grains imbibe it ſlowly, and during expanſion revolve on their axes with a pretty regular motion, exhibiting a ſpectacle no leſs novel than delightful. In the mean time, ſome minute particles are ſeen to be ejected, and, the motion ceaſing, the tranſparency returns, proceeding from the ſurface to the centre.

If a piftil be feparated from the expanded flower with grains of pollen adhering to it, the latter will be found already expanded to a fpheroid. Cover the whole with a drop of fpirit on the glafs, the piftil is not affected in any way, but fome of the grains quit it and revolve on their axes. When thefe are exhaufted, the addition of more fpirit excites others: after a few minutes, fome of thofe firft excited begin to put out a fmall thread, which gradually elongating, the grain diminifhes in proportion, until it is entirely drawn out into a vermicular fibre, which again is prefently diffipated into particles too minute to be feen in the now opake medium. The liquor from the tube of the piftil, and a folution of fugar in water, were alfo found to produce this evolution in very mature grains from the anther. It alfo fometimes takes place in the twinkling of an eye, fo as to be fcarcely traced in fome few grains out of a number put into fpirit at once. Thofe which have been fome time in contact with the piftil are always moft fluggifh in their evolution.

5. *Carex acuta.*

Anthers oblong, crumbling. Pollen angular, opake, with apparent perforations. It dilates in fpirit and remains ftationary, but ejects numerous minute particles in rapid fucceffion from its furface. When it has become tranfparent it appears as if filled with feeds.

The preceding may ferve for examples of thefe phænomena; but there was not one among the various fpecies I examined, which did not exhibit them in a greater or lefs degree. Yet various other parts of the flower, immerfed in fpirit under the microfcope, did not betray the fmalleft veftige of them.

The proper fpirit for this purpofe feems to be a mixture of one part pure fpirit of wine with two of water. A ftronger fpirit, or even fpirit of wine alone, may fometimes be required when we operate upon a pollen which has, by any means, become previoufly

 faturated

ſaturated with moiſture, (or has loſt, by keeping, a part of its irritability?) but it does not enter the dry grains ſo readily as water alone.

I have ſince ſubjected pollen to examination in ſeveral of the moſt ſtimulant oily and ſaline liquids, but have not been able to perceive that any of them had a ſimilar effect on it.

It is proper here to remark that the utmoſt care is requiſite to prevent accidental mixtures of the ſubjects or menſtrua in theſe experiments, which might greatly embarraſs and miſlead the obſerver. Separate pieces of clear glaſs for the ſeveral kinds, and ſeparate pointed glaſs tubes to convey the liquids, will therefore be requiſite. It will be proper attentively to examine the pollen dry, as well as the liquids, before they are uſed, in order to be ſatisfied of the abſence of animalcules and other extraneous matters which might be ſuſpected to influence the appearances.

I do not pretend to ſay that the above-related experiments were abſolutely free from optical deception; but I may venture to affirm, from frequent repetition of them, that, when tried with due precaution, they will ſcarcely ever be found to fail of producing the appearances related.

Engagements of ſuperior importance at preſent prevent, and may long continue to prevent, my puſhing theſe inquiries much further. It is for this reaſon, and becauſe I ſhould take a pleaſure in ſeeing it done by ſome perſon more capable of executing them with due exactneſs, and drawing proper inferences from them, that I am willing to make them known in their preſent imperfect ſtate. For the aſſiſtance of thoſe who may incline to proſecute the ſubject, I ſhall now ſtate the amount of the preſent diſcovery, and the hints for further inveſtigation which have occurred to me.

Should it be found, on repeating and extending theſe obſervations,

tions, that the pollen of vegetables is in all caſes ſimilarly acted upon by water and by ſpirit of wine, it will follow,—

1. That each grain of pollen in the anther is an organic body, variouſly conſtructed in various ſpecies, and containing

a Veſſels or pores capable of imbibing water, of diſtending thereby and contracting again when it quits them; in which particulars they reſemble ſponge, &c.

b A parenchyma, conſiſting of ſome ſubſtance (of greater ſpecific gravity than water, and inſoluble therein), which is emitted with a greater or leſs degree of force when the ſtimulus of alcohol is applied to the abſorbent veſſels. This ſubſtance is either in part ſoluble in alcohol, or the grains contain

c An eſſential oil or reſin, to which they owe their colour and odour.

2. That there exiſts in the grains of pollen, in a very eminent degree, that property of vegetables called irritability, which they are capable of retaining for a certain time after ſeparation from the anther.

3. That alcohol is the proper ſtimulus by which this irritability may be excited, and the texture of the pollen in ſome manner developed in conſequence thereof. I prefer this method of accounting for the appearances that take place when the pollen is immerſed in ſpirit to another that might be ſuppoſed on chemical principles, being aſſured, that any one who has once inſpected the proceſs will be ſatisfied that ſomething more than mere ſolution or chemical decompoſition takes place therein, and that the vital principle of the pollen is the chief agent.

The liquor from the tube of the piſtil and the ſolution of ſugar were, indeed, found to bring on the evolution of the pollen of *Cactus flagel.* in a ſlower manner than ſpirit; but when we conſider how ſpeedily

ſpeedily ſuch matters paſs into the vinous ſtate, it ſeems poſſible that both of theſe might contain alcohol. Yet, it is alſo poſſible that ſomething common to this latter ſubſtance, with the ſaccharine matter it is producible from, may be the real exciting cauſe.

The exiſtence of abſorbent veſſels in the pollen is proved by the change of form, increaſed tranſparency, and great diſtention produced by the water. It is remarkable, that complete ſaturation uſually brings the grains near to a ſpherical ſhape, however remote from it their original one.

It ſeems neceſſary to ſuppoſe the parenchyma for the following reaſons. Something is evidently given out to the ſpirit before the diſperſion of the grain commences. In ſome caſes this is viſible in minute particles moving about in the drop; in others it is diſcoverable by the tinge on the dried ſpace, and by the ſtriæ which appear when more ſpirit is added. Now, if the grains conſiſted merely of the vegetable fibre formed into veſicles or cells, their texture would no more be deſtroyed by ſpirit than by water, and the penetration of the water would produce the ſame motions as that of the ſpirit. But if we ſuppoſe that, in proportion as the ſpirit penetrates the ſeveral parts of theſe curious capſules, ſome tranſparent ſubſtance is forcibly expelled from them; the various motions into which they are thrown will be eaſily explained by the recoil of the grain in the oppoſite direction. It will hence appear why the pollen of 1. which ſeems to conſiſt of many ſeparate cells, is driven alternately in all directions by their ſucceſſive diſcharge, and why that of 4. which is a long tube rolled up, and probably with but one orifice, is thrown into a rotatory motion. The opacity of this ſpecies during the diſcharge may be attributed to the evacuation of this canal, and the returning tranſparency to the entrance of the ſpirit into it from the abſorbent veſſels, or at the orifice. I do not remember to have

have feen a fingle bubble of air efcape from the grains of pollen in the whole courfe of my obfervations. As their texture was in many cafes quite deftroyed, if it had been porous, as that of dry wood, &c. air muft have appeared. I therefore conclude them perfectly folid in the dry ftate.

I think it poffible that the profecution of thefe inquiries by means of the microfcope, may throw fome light on the obfcure fubject of vegetable reproduction; may teach us why the anther is almoft always expofed to the air for fome time previous to the difcharge of the pollen, and this even in aquatic plants; as alfo what is the office of that faccharine liquor with which the ftigma is furnifhed, and of which fuch a ftore is fometimes provided in the nectary. The very manner in which the impregnation takes place may poffibly be learned by attentive obfervation.

The fimilarity of the unfolded pollen of No. 4. to the form of the plant it comes from, might furnifh matter for fpeculation; but I decline this, believing that experiment and careful obfervation muft always precede found theory.

Reflecting on fome of the properties of pollen in which it bears a refemblance to ftarch, I was led to examine that alfo in a fimilar manner, and was not difappointed to find its ftructure the fame. Starch confifts of homogeneous grains or capfules fhaped like No. 3. capable of imbibing water with increafe of bulk and tranfparency, and of returning to their original ftate on parting with it. They are alfo difperfed, with more or lefs of motion, in fpirit; but in this particular different fpecimens were found to vary, which may be attributed to difference in age or foundnefs. If a little wheat flour be mixed with water and fpread on the glafs, thefe grains appear in great abundance, mixed with fibrous matter. Other kinds of grain afforded the fame refult, with a difference in the form of the

the capsules. As the vegetable fæculum, which consists entirely of this kind of matter separated from the soluble and fibrous part, has been long considered as the same substance, though obtainable from different parts of vegetables, I extended the inquiry to tuberous roots, and obtained a further confirmation of the identity of pollen and fæculum. A potatoe seems to be almost nothing else but an assemblage of grains of fæculum, with their interstices occupied by the juice. If this root be boiled or baked until it becomes mealy, the juice will no longer be found; and we might be at a loss to know what was become of it, if the microscope did not show that it has entered into the grains of fæculum, which are thereby greatly distended, as is, indeed, evident to the naked eye. The vital principle is thus destroyed; for these bloated grains will not move in spirits, but give out a tincture to it like other dead matter. By this means, and the loss of solidity, they are prepared for more easy decomposition in the stomach.

Starch is absolutely insoluble in water. If water containing it be made to boil, it becomes a jelly. I do not apprehend that a true solution takes place even in this case. It appears that the same effect is produced on the grains by the heat as by spirit of wine. They are dispersed into very minute particles; and the surface being thus multiplied, a greater degree of attraction takes place between the starch and the water, and the former remains suspended.

It appears to me to be worthy of future inquiry,

1. In what parts of vegetables in general the pollen or fæculum is to be found.

2. In what respects that which is secreted on the anther differs from that which is contained in the root, seed, or sap. In the leaf, petal, bulb, fibre of the root, or other parts already brought to perfection, I am inclined, from some observation, to think it will not be met with.

3. Whether the germ or embryo of the feed, previous to the impregnation, contains it.

4. In what manner the pollen of plants in general will be acted upon by the liquor from the nectary, when expofed to it in circumftances fimilar to thofe of Exp. 4.

5. And laftly, to inveftigate the varieties in form and ftructure of the different fpecies of pollen; and to examine how far they agree or differ in the feveral fpecies of each genus, and genera of each natural order.

IV. *Obfervations on Aphides, chiefly intended to fhow that they are the principal Caufe of Blights in Plants, and the fole Caufe of the Honey-Dew. By the late Mr. William Curtis, F. L. S.*

Read May 6, 1800.

THE *Aphis*, or Blighter, as we now for the firft time venture to call it, from its being the moft general caufe of what are termed blights in plants, forms a highly interefting tribe of infects. In point of number, the individuals of the feveral fpecies compofing it furpafs thofe of any other genus in this country *.

Thefe infects live entirely on vegetables. The loftieft tree is no lefs liable to their attacks than the moft humble plant. They prefer the young fhoots on account of their tendernefs, and on this principle often infinuate themfelves into the very heart of the plant, and do irreparable mifchief before they are difcovered. But for the moft part they befet the foliage, and are always found on the under fide of the leaf, which they prefer, not only on account of its being the moft tender, but as it affords them protection from the weather, and various injuries to which they would otherwife be expofed. Sometimes the root is the object of their choice, which, from the nature of thefe infects, one would not *à priori* expect ; yet have I feen the roots of lettuces thickly befet by them, and the whole crop rendered fickly and of little value : but fuch inftances are rare. They rarely

* Reaumur, confidering each *Aphis* as bringing forth ninety young, calculates that in five generations the produce from a fingle one would be five thoufand nine hundred and four million nine hundred thoufand.

 alfo

alfo attach themfelves to the bark of trees, like the *Aphis falicis*, which being one of our very largeft fpecies, and hence poffeffing fuperior ftrength, is enabled to penetrate a fubftance harder than the leaves themfelves.

As among caterpillars we find fome that are conftantly and unalterably attached to one or more particular fpecies of plants, and others that feed indifcriminately on moft forts of herbage; fo it is precifely with the *Aphides*: fome of them are particular, others more general feeders.

As they refemble other infects in the above refpect, fo do they alfo in being infinitely more abundant fome years than others; and though, with regard to certain infects, this variation (fometimes wonderful in the extreme, as in the brown-tail moth which ravaged the quickfet hedges in 1782) is not eafily accounted for, it is folved without much difficulty as to the *Aphis*, as will be fhown in the fequel. In the year 1793 they were the chief, and in 1798 the fole, caufe of the failure of the crop of hops. In 1794, a feafon almoft unparalleled for drought, the hop was perfectly free from them, while peas and beans, efpecially the former, fuffered very much from their depredations. Beans were in 1798 almoft wholly cut off by them; indeed they fuffer more or lefs every year by a black fpecies of *Aphis*, particularly the latter crops. To potatoes, and even to corn, we have known them fome years prove highly detrimental, and no lefs fo to melons. To plants in ftoves, greenhoufes and frames, where, from the warmth and fhelter afforded them, a preternatural multiplication takes place, they prove extremely injurious, and many a rare and valuable plant alfo in the open ground of our botanic gardens falls a victim to thefe general depredators. Seeing, therefore, that our neceffaries as well as luxuries of life are fo materially affected by the infects of this genus, an attempt to afcertain fome of the curious and important facts

 relative

relative to their hiſtory, and to make them more generally known, will not, we truſt, be unacceptable to the public. Such inquiries may poſſibly lead to the means of obviating the injuries they occaſion; and if they fail in this, they may tend at leaſt to correct the erroneous notions entertained of blights, not by the vulgar and illiterate merely, but even by perſons of education, who may frequently be heard to maintain that theſe inſects are brought by the eaſt winds; that they attack none but ſickly plants; with other notions, all as falſe in fact as unphiloſophical in principle.

Locuſts and caterpillars, famed for their devaſtations, are furniſhed with ſtrong jaws, by means of which they crop and wholly devour the foliage of plants. The *Aphis* deſtroys them in a different way. Inſtead of jaws and teeth it is provided with a hollow-pointed proboſcis or trunk, which, when the animal is not feeding, folds under its breaſt. With this inſtrument it pierces the plant, and imbibes its juices to ſupport itſelf; but theſe juices being eſſential to the life of the plant, it follows that, when they are drawn off, the plant, exhauſted, flags and periſhes, being in fact literally bled to death by theſe leech-like animalcules. Yet, ſo tenacious of life are plants in a healthy ſtate, that they in general only fall victims to the continued attacks of theſe inſects when in immenſe numbers. But it moſt commonly happens that if they do not wholly deſtroy a plant they deface it, and a ſmall number of *Aphides* are ſufficient to produce this effect. The leaves of ſuch trees and plants as have a firm texture and ſtrong fibres, though infeſted with theſe inſects, preſerve their form; but the more tender foliage of others, and flowers in general, cannot bear their punctures without curling up and becoming diſtorted; in conſequence of which they loſe their beauty entirely and irretrievably. The cultivators of plants, eſpecially in ſtoves and green-houſes, cannot be too much on their guard againſt the whole tribe of *Aphides*; for with what pleaſure can a

large

large or choice collection be viewed, when there is ſcarcely a plant but what exhibits ſymptoms of diſeaſe occaſioned by vermin?

As the ſpecies of this genus are very numerous, and afford but few marks of diſtinction, Linnæus has contented himſelf with giving moſt of them trivial names, according to the particular plant on which they are found: a cloſe attention to them will, however, diſcloſe more diſtinctive characters than naturaliſts are aware of.

Aphides are deſcribed by the beſt informed authors as being generally oviparous and viviparous at different periods of the ſame year. Monſ. Bonnet, who had the honour of making this diſcovery in 1740*, ſays that in the ſummer the females are viviparous, but toward the middle of autumn they lay real eggs. De Geer obſerves, that the females of all the *Aphides* he had ſeen, conſtantly laid eggs, intended to preſerve the ſpecies during winter, and that he is therefore inclined to believe that the ſame takes place in all *Aphides* whatever. From the 24th of September to the 6th of December following, during which time Fahrenheit's thermometer had been as low as 29, I found the *Aphis ſalicis* to be conſtantly viviparous, though from the inclemency of the weather very few of theſe inſects at the period laſt mentioned remained on the trees, and thoſe few were ſoon after entirely cut off by the unuſual cold that took place, the thermometer falling to 4 degrees below 0.—Other *Aphides* are oviparous or viviparous according to the temperature of the air to which they are expoſed. In very cold weather they are oviparous, for this obvious reaſon: the eggs are capable of reſiſting cold more powerfully than the young. On the 22d of November ſame year as above, I found a conſiderable number of eggs which had been depoſited in ſome auricula plants by a ſmall green *Aphis*,

* Or rather Monſ. Trembley. See his Letter to M. Bonnet from the Hague: Oeuvres de Bonnet.

which

which infests plants very generally*, while the same *species*, on a geranium that I kept within doors, produced young. In mild winters I have observed, in the month of January, the same species of *Aphis* in great numbers on various species of primula without doors, and all the females viviparous. These are facts which prove that all *Aphides* are not oviparous and viviparous at the same season, but that some may be wholly viviparous; that all such as are both oviparous and viviparous do not lay eggs toward the middle of autumn, nor at all during the winter, unless a certain degree of cold takes place.

Most people will think it a matter of very little moment to mankind whether an *Aphis* comes into the world with its head or its heels foremost:—it may be so; yet, as nature's historian, it is perhaps incumbent on us to notice this circumstance. The young *Aphis* then is ushered into the world with its feet foremost, see TAB. V. fig. 1., and this act of parturition, unimportant as it may appear, serves to display the wisdom of the all-provident Author of Nature. The female *Aphis* is usually delivered of its offspring as it sits close to the bark of the tree, but not suddenly and all at once. Two-thirds of the body of the young one is quickly protruded. When it gets so far, the power of expulsion ceases, and the delivery proceeds slowly. Time is thus given to the young one to learn the use of its legs, which it soon kicks about briskly, and the first service it employs them in is to clean away a white substance, the remains, perhaps, of the membrane in which it was enveloped in the womb.

* These eggs were laid in small, irregular groups, on the upper as well as on the under side of the leaves; they were of a perfectly black colour, and very visible to the naked eye. I found afterwards that the eggs when recently excluded were green, from which colour they gradually changed to that which rendered them so conspicuous. They were slightly attached to the leaf.

But

But what is of greater conſequence is, that it is enabled by their uſe to cling faſt to the bark of the tree as ſoon as it is brought forth, and thus to obtain its neceſſary nutriment.

Of ſome of the circumſtances attendant on the propagation of theſe minute animals accounts are related, deviating ſo wonderfully from the common courſe of nature, that they could not be credited, were not the authors of them known to be men of the niceſt and moſt accurate obſervation and of the ſtricteſt veracity. On this part of the ſubject I have little to ſay from my own obſervation; but, as ſome account of ſo extraordinary a part of their hiſtory may be expected in a paper of this ſort, I ſhall ſtate the facts, briefly obſerving that neither in the *Aphis ſalicis*, which at times I have watched with great attention, nor in any other ſpecies of *Aphis*, did I ever obſerve any ſexual intercourſe to take place. Whether this has ariſen from the extreme infrequency of ſuch a procedure, or from my not having obſerved theſe inſects at a proper time of the year, I know not; but, moſt undoubtedly, ſuch intercourſe does not take place between the different ſexes of *Aphis* as in other inſects. Yet Monſ. Bonnet, who may be ſaid to have almoſt taken up his abode with theſe inſects, informs us that he has frequently noticed ſuch connexion, which he deſcribes as taking place at one certain time of the year only; and that, from a female thus impregnated, many ſucceſſive generations will be produced without any further impregnation. He took the *Aphides* as ſoon as brought forth, and kept each individual ſeparate. The females of ſuch brought forth abundance of young. He took the young of theſe and treated them preciſely in the ſame manner. The produce was the ſame; and thus he proceeded to the ninth generation with the ſame ſucceſs: and ſo far from conſidering that as the utmoſt extent of the effect, he thinks it might be carried on to the thirtieth generation.

In

In moft fpecies of *Aphides* both males and females acquire wings at certain feafons; but in this refpect they are fubject to great variation, there being fome males and fome females that never have wings; again, there are fome females that become winged, while others of the fame fpecies do not.

In the quality of the excrement voided by thefe infects there is fomething wonderfully extraordinary. Were a perfon accidentally to take up a book in which it was gravely afferted that in fome countries there were certain animals which voided liquid fugar, he would foon lay it down, regarding it as a fabulous tale, calculated to impofe on the credulity of the ignorant; and yet fuch is literally the truth.

The fuperior fize of the *Aphis falicis* will enable the moft common obferver to fatisfy himfelf on this head. On looking ftedfaftly for a few minutes at a group of thefe infects while feeding on the bark of the willow, one perceives a few of them elevate their bodies, and a tranfparent fubftance evidently drop from them, which is immediately followed by a fimilar motion and difcharge like a fmall fhower from a great number of others. At firft I was not aware that the fubftance thus dropping from thefe animals at fuch ftated intervals was their excrement, but was convinced of its being fo afterwards; for, on a more accurate examination, I found it to proceed from the extremity of the abdomen, as is ufual in other infects. On placing a piece of writing-paper under a mafs of thefe infects, it foon became thickly fpotted; holding it a longer time, the fpots united from the addition of others, and the whole furface affumed a gloffy appearance. I tafted this fubftance, and found it to be as fweet as fugar. I had the lefs hefitation in doing this, having obferved that wafps, ants, flies, and infects without number, devoured it as quickly as it was produced: but, were it not for thefe, it might no doubt be collected in confiderable quantities, and, if fubjected to the

proceffes ufed with other faccharine juices, might be converted into the choiceft fugar or fugar-candy. It is a fact alfo, which appears worthy of noticing here, that, though the wafps are fo partial to this food, the bees appear totally to difregard it.

In the height of fummer, when the weather is hot and dry, and *Aphides* are moft abundant, the foliage of trees and plants (more efpecially in fome years than others) is found covered with, and rendered gloffy by, a fweet clammy fubftance, known to perfons refident in the country by the name of *honey-dew:* they regard it as a fweet fubftance falling from the atmofphere, as its name implies.

The fweetnefs of this excrementitious fubftance, the gloffy appearance it gave to the leaves it fell upon, and the fwarms of infects this matter attracted, firft led me to imagine that the honey-dew of plants was no other than this fecretion, which further obfervation has fince fully confirmed. Others have confidered it as an exudation proceeding from the plant itfelf. Of the former opinion we find the Rev. Gilbert White, one of the lateft writers on natural hiftory that has noticed this fubject *.

But that it neither falls from the atmofphere, nor iffues from the plant itfelf, is eafily demonftrated. If it fell from the atmofphere, it would cover every thing on which it fell indifcriminately, whereas we never find it but on certain living plants and trees. We find it alfo on plants in ftoves and green-houfes covered with glafs. If it exuded from the plant, it would appear on all the leaves generally

* "June 4th, 1783. Vaft honey-dews this week. The reafon of thefe feems to be, that in hot days the effluvia of flowers are drawn up by a brifk evaporation, and then in the night fall down with the dews, with which they are entangled.

"This clammy fubftance is very grateful to bees, who gather it with great affiduity; but it is injurious to the trees on which it happens to fall, by ftopping the pores of the leaves. The greateft quantity falls in ftill, clofe weather; becaufe winds difperfe it, and copious dews dilute it, and prevent its ill effects. It falls moftly in hazy, warm weather." See *White's Naturalift's Calendar, p.* 144.

and

and uniformly; whereas its appearance is extremely irregular, not alike on any two leaves of the ſame tree or plant, ſome having none of it, and others being covered with it but partially.

But the phænomena of the honey-dew, with all their variations, are eaſily accounted for by conſidering the *Aphides* as the authors of it. That they are capable of producing an appearance exactly ſimilar to that of the honey-dew, has already been ſhown. As far as my obſervation has extended, there never exiſts any honey-dew but where there are *Aphides*; ſuch, however, often paſs unnoticed, being hid on the under ſide of the leaf. Wherever honey-dew is obſervable about a leaf, *Aphides* will be found on the under ſide of the leaf or leaves immediately above it, and under no other circumſtances whatever. If by accident any thing ſhould intervene between the *Aphides* and the leaf next beneath them, there will be no honey-dew on that leaf. Thus then we flatter ourſelves to have incontrovertibly proved that *Aphides* are the true and only ſource of the honey-dew.

We have found that where the ſaccharine ſubſtance has dropped from *Aphides* for a length of time, as from the *Aphis ſalicis* in particular, it gives to the ſurface of the bark, foliage, or whatever it has dropped on, that ſooty kind of appearance which ariſes from the exploſion of gun-powder, which greatly disfigures the foliage, &c. of plants. It looks like, and is ſometimes miſtaken for, a kind of black mildew. We have ſome grounds for believing that a ſaccharine ſubſtance, ſimilar to that of the *Aphis*, drops from the *Coccus* alſo, and is finally converted into the ſame kind of powder.

In moſt ſeaſons the natural enemies of the *Aphides* are ſufficient to keep them in check, and to prevent them from doing any eſſential injury to plants in the open air. But ſeaſons ſometimes occur, very irregularly indeed, on an average, perhaps, once in four or ſix years, in which they are multiplied to ſuch an exceſs, that the

M 2 uſual

uſual means of diminution fail in preventing them from doing irreparable injury to certain crops.

In ſevere winters we have no doubt but *Aphides* are very conſiderably diminiſhed; in very mild winters we know they are very conſiderably increaſed; for they not only exiſt during ſuch ſeaſons, but continue to multiply. Their enemies, on the contrary, exiſt, but do not multiply, at leaſt in the open air, during ſuch periods; and thus the *Aphis* gets the ſtart of them, and acquires an aſcendency, which once acquired is not eaſily overcome by artificial means, upon a large ſcale at leaſt, in the open air. Vain would be the attempt to clear a hop-garden of theſe pernicious vermin, or to reſcue any extenſive crop from their baneful effects. Violent rains attended with lightning have been ſuppoſed to be very effectual in clearing plants of them; but in ſuch caſe more is to be attributed to the plants being refreſhed and made to grow by the rain, of which they ſtood in need, than to any deſtruction of the *Aphides* themſelves, which, on an accurate examination, will be found to be as plentiful after ſuch rains as they were before; nor is wet ſo injurious to theſe inſects as many imagine, as is evident from the following experiment: On the 12th of May 1799, I immerſed in a glaſs of water the footſtalk of a leaf of conſiderable length, taken from a ſtove plant, beſet with *Aphides* of a dark lead colour, which were feeding on it in great numbers. On immerſion they did not quit the ſtalk, but immediately their bodies aſſumed a kind of luminous appearance from the minute bubbles of air which iſſued from them. They were put under water at a quarter paſt ſix in the evening, and taken out at a quarter paſt ten the next morning, having continued immerſed ſixteen hours. On placing them in the ſun-ſhine, ſome of them almoſt immediately ſhowed ſigns of life, and three out of four at leaſt ſurvived the immerſion. One of the ſurvivors, a male, very ſoon became winged, and another, a female,

was

was delivered of a young one. Many years before this experiment, with a view to deſtroy the *Aphides* which infeſted a plant in my green-houſe, I immerſed one evening the whole plant, together with the pot in which it grew, in a tub of water. In the morning I took out the plant, expecting with certainty to find every *Aphis* dead; but to my great ſurpriſe they ſoon appeared alive and well: and thus, in addition to the other extraordinary phænomena attendant on theſe inſects, we find that they are capable of reſiſting the effects of immerſion in water for a great length of time. When taken from the plant on which they feed, and kept under water, they do not ſurvive ſo long; their ſtruggling in that caſe perhaps exhauſts them ſooner. This part of the ſubject might be puſhed much further: it is ſufficient for our purpoſe to have ſhown that wet is not ſo hurtful to them as is generally imagined.

Though no mode of deſtroying *Aphides* will perhaps ever be deviſed on a large ſcale in the open air by artificial means, we can accompliſh it moſt effectually when they infeſt plants in ſtoves, green-houſes, and frames, or in any ſituation in which we can envelop them for a certain time in clouds of ſmoke. Powders or liquids, however fatal to *Aphides*, muſt ever be ineffectual, from the trouble and difficulty of applying them ſo that they ſhall come in contact with thoſe inſects, ſituated as they uſually are; but in this reſpect ſmoke has every advantage, it penetrates and pervades their inmoſt receſſes. The ſmoke of common vegetables, however powerful, is found to be inadequate to their deſtruction, and hitherto no other than that of tobacco is found to be effectual. That, judiciouſly applied, completely anſwers the purpoſe, without injuring the plant. It moſtly happens in well managed houſes that a few plants only are infeſted with *Aphides*: in ſuch a caſe, the ſmoking of the whole houſe is a buſineſs of unneceſſary expenſe and trouble; and we would recommend to perſons who have large collections to make uſe

of a box of a commodious form that ſhall hold about a dozen plants of various ſizes, to be uſed as a ſort of hoſpital, in which infeſted plants may be ſmoked ſeparately, and the inſects more effectually deſtroyed, becauſe it may be rendered more perfectly ſmoke-tight.

To prevent the calamities which would infallibly reſult from the accumulated multiplication of the more prolific animals, it has been ordained by the Author of Nature, that ſuch ſhould be diminiſhed by ſerving as food for others. On this principle, we find that moſt animals in this predicament have one or more natural enemies. The helpleſs *Aphis*, the ſcourge of the vegetable kingdom, has to contend with many. The principal are the *Coccinella*, the *Ichneumon Aphidum*, and the *Muſca aphidivora*. Such as are unacquainted with the hiſtory of inſects will learn with ſome ſurpriſe that the *Coccinella**, a common inſect well known even to children by the name of the Lady-bird, is one of the greateſt deſtroyers of the *Aphides*, which indeed are its only food, its ſole ſupport, as well in its perfect as in its *larva* or grub ſtate. During the ſeverity of winter this inſect ſecures itſelf under the bark of trees, or elſewhere†. When the warmth of ſpring has expanded the foliage of plants, the female depoſits its eggs on them in great numbers, from whence in a ſhort time proceeds the *larva*, a ſmall grub of a dark lead colour ſpotted with orange: theſe may be obſerved in the ſummer ſeaſon running pretty briſkly over all kinds of plants; and if narrowly watched, they will be found to devour the *Aphides* wherever they find them. The ſame may be obſerved of the Lady-bird in its perfect ſtate. As theſe inſects in both their ſtates are very

* All the different ſpecies of *Coccinella* feed on *Aphides*; the *bipunctata*, by far the moſt common, does the moſt execution.

† Many are found in houſes; for, early in May 1799, I counted on the window of my common ſitting-room, expoſed to the ſun, nineteen of the *Coccinella bipunctata*.

very numerous, they contribute wonderfully to diminifh the number of *Aphides*. There is a faying which humanity has put into the mouths of children in favour of this infect *, now rendered more facred by its great utility, which has happily rendered it a fort of favourite with them, and contributes ufually to its efcape from their dangerous clutches. Another moft formidable enemy to the *Aphis* is a very minute, black and flender Ichneumon fly, the *Ichneumon Aphidum* of Linnæus. The manner in which this infect proves fo deftructive to the *Aphis* is different from that of the Lady-bird. The female Ichneumon, of which numbers may be found where *Aphides* are in plenty, fettles on a ftalk, or leaf, more or lefs covered with them, marches flowly over their bodies, feeling with its *antennæ* as it proceeds for one of a fuitable fize and age; which having difcovered, it pufhes forward its body, or abdomen, in an incurved ftate, and with a fine inftrument at its extremity, invifible to the naked eye, punctures, and depofits an egg in, the body of the *Aphis*; which having done, it proceeds, and lays an egg in a fimilar way in the bodies of many others. The egg thus depofited quickly hatches, and becomes a fmall *larva*, or maggot, which feeds on the fubftance of the *Aphis*, and, having eaten the whole of it, the fkin excepted, it changes to a *pupa*, or chryfalis; in which ftate when it has remained a fufficient time, it becomes an Ichneumon fly, which eats its way out of the *Aphis*, leaving the dry inflated fkin of the infect adhering to the leaf, like a fmall pearl. Such may always be found where *Aphides* are in plenty. We have obferved different fpecies of *Aphides* to be infefted with different Ichneumons.

In general the torpid *Aphis* fubmits quietly to this fatal operation; but we have obferved fome of them, efpecially one that feeds on the

* "Lady-bird, lady-bird, fly away home! Your houfe is on fire, your children at home."

fycamore,

fycamore, which is much more agile than many of this race, endeavour to avoid the Ichneumon with great addrefs.

There is, perhaps, no genus of infects which in their *larva* or maggot ftate feed on fuch a variety of food as the *Mufca*, or Fly. There is fcarcely a part of nature, either animate or inanimate, in which they are not to be met with. One divifion of them, called by Linnæus *Mufcæ aphidivoræ*, feeds entirely on *Aphides.* Of the different fpecies of aphidivorous flies, which are numerous, having moftly bodies variegated with tranfverfe ftripes, their females may be feen hovering over plants infefted with *Aphides*, among which they depofit their eggs, on the furface of the leaf. The *larva*, or maggot, produced from fuch eggs feeds, as foon as hatched, on the younger kinds of *Aphis*; and, as it increafes in fize, attacks and devours thofe which are larger. Thefe *larvæ* are ufually of a pale colour, adhere clofely to the leaf, along which they flowly glide, and are formed very tapering towards the head. When fully grown, they change to a *pupa*, or *chryfalis*, attached to the leaf, from whence iffues the fly. The *larvæ* of thefe flies contribute their full fhare to diminifh the defpoilers of Flora. To thefe three kinds of infects, which are the chief agents in the hands of Nature for keeping the *Aphides* within their proper limits, we may add a few others which act a fubordinate part in this neceffary bufinefs of deftruction.

The *larva* of the *Hemerobius* feeds on them in the fame manner as that of the *Mufca aphidivora*, and depofits its eggs alfo on the leaves of fuch plants as are befet with *Aphides.* The eggs of this *Hemerobius* ftand on long filaments, which are attached by a bafe to the leaf, and have more the appearance of the filaments of flowers with their *antheræ* than the eggs of an animal. The number of

thefe

thefe infects being comparatively very fmall, they may be confidered rather as the cafual invaders of their exiftence than the main hoft of their deftroyers.

The Earwig, which is in itfelf no contemptible enemy to plants, makes fome atonement for its depredations by deftroying the *Aphides*; efpecially fuch as refide in the curled-up leaves of fruit-trees, and the purfes formed by certain *Aphides* on the poplars and other trees.

Laftly, we may add as the enemies of thefe creatures, fome of the fmaller foft-billed birds, which feed generally on infects, and which may frequently be feen bufily employed in picking them from the plants. Their utility did not efcape the obfervation of the pleafing author of the Seafons. We fhall quote the whole of what he writes on this fubject, prefuming that none of our readers will think it too long; remarking, however, that he has fallen into the error of moft others in regard to the manner in which thefe infects are faid to be brought by the eafterly winds, and that he confounded the mifchiefs of Caterpillars with thofe of the *Aphis*.

"For oft engender'd by the hazy north,
Myriads on myriads, infect armies warp
Keen in the poifon'd breeze, and wafteful eat
Thro' buds and bark into the blacken'd core
Their eager way. A feeble race! yet oft
The facred fons of vengeance, on whofe courfe
Corrofive famine waits, and kills the year.
To check this plague, the fkilful farmer chaff,
And blazing ftraw, before his orchard burns,
Till, all involv'd in fmoke, the latent foe
From every cranny fuffocated falls;
Or fcatters o'er the blooms the pungent duft
Of pepper, fatal to the frofty tribe;
Or, when the envenom'd leaf begins to curl,
With fprinkled water drowns them in their neft;
Nor, while they pick them up with bufy bill,
The little trooping birds unwifely fcares.

 When

When plants affume a fickly appearance, or are disfigured by difeafe, from whatever caufe the difeafe may arife, they are faid to be blighted. Blights originate from a variety of caufes, the chief of which are unfavourable weather and infects.

Two opinions prevail very generally in regard to blights: the one, that the infects which are the caufe of them are brought from a diftance by eafterly winds; the other, that they attach themfelves to none but plants already fickly. Neither of thefe opinions, as far as I have obferved, is founded in fact. I am induced, from the numerous obfervations I have made on infects for a feries of years, (in purfuing the cultivation of plants) to confider the *Aphis* as by far the moft general caufe of the difeafes diftinguifhed by the name of blights. Other infects, it is true, more efpecially the *larvæ* of fome of the *Lepidoptera*, as thofe of the *Phalænæ tortrices*, disfigure and do infinite mifchief to plants, by rolling and curling up the leaves. But thefe for the moft part confine themfelves to certain trees and plants. Their ravages alfo are of fhorter duration, being confined to the growth of one brood, and they are alfo lefs fatal. It would be no difficult matter for me to fill a volume with obfervations, to which I have been an eye witnefs, of the injuries which plants fuftain from infects; but that would be foreign to my prefent purpofe, which is to fhow that the *Aphis* is the grand caufe of thefe difeafes, and to place the *modus operandi*, or the manner in which they effect this bufinefs, in its true light.

We are fully aware that certain gregarious infects may at particular times rife up in the air, and, if fmall and light, be impelled by any wind that may chance to blow at the time; and on this principle we account for that fhower of *Aphides* defcribed by Mr. White to have fallen at Selborn. But certainly this is not the mode in which thofe infects are ufually difperfed over a country. The phænomenon is too unufual, the diftribution would be too partial; for *Aphides*,

Aphides, while at their higheſt point of multiplication, do not ſwarm like bees or ants, and fly off or emigrate in large bodies; but each male or female *Aphis*, at ſuch periods as they arrive at maturity, marches or flies off without waiting for any other. Yet it may happen that, from a tree or plant thickly beſet with them, numbers may fly off or emigrate together, being arrived at maturity at the ſame moment of time.

Detaching itſelf from the plant, each purſues a different route, intent on the great buſineſs of multiplying its ſpecies; and ſettles on ſuch plants in the vicinity as are calculated to afford nouriſhment to its young.

The common green *Aphis*, which is ſo generally deſtructive, lives during the winter ſeaſon on ſuch herbaceous plants as it remained on during the autumn, either in its egg or perfect ſtate. If the weather be mild, it multiplies greatly on ſuch herbage; as the ſpring advances, in May the males and females of theſe inſects acquire wings: and thus the buſineſs of increaſe, hitherto confined, is widely and rapidly extended, as the winged *Aphides*, by hop-planters called the Fly, may be ſeen from this period very generally ſitting on plants, and floating in the air in all directions.

Minutes of Appearances obſerved in the Aphis ſalicis *from the End of September to December 6th.*

The *Aphis ſalicis* is among the largeſt Engliſh ſpecies, and is found on the bark both of the trunk and branches of the *Salix triandra*, *fragilis*, and *viminalis*, but moſt abundantly on the laſt. The bodies of theſe inſects contain a red liquid, and hence perſons employed in ſtripping oſiers have their hands rendered apparently bloody by unavoidably bruiſing them.

Near the end of September multitudes of the full grown inſects of this ſpecies, both winged and others, are obſerved to deſert the

willows on which they feed, and to ramble ſolitarily over every neighbouring object, in ſuch numbers that we can handle nothing in their vicinity without cruſhing ſome of them. Are they retreating to freſh trees, on which to depoſit their young, or ſeeking ſome warmer ſituation for the winter ſeaſon? Vaſt numbers of them, moſtly in a younger ſtate, ſtill remain in large maſſes on the trees.

Though numberleſs inſects, Waſps in particular, were devouring the ſweets they depoſited, the Lady-bird *(Coccinella)* was the only one which preyed on the *Aphides* themſelves; and theſe towards the end of the month began to relax their depredations, and to retreat to their winter quarters.

As the ſeaſon advances, the *Aphides* are found higher on the trees, proceeding gradually upwards in queſt of new food. When the young *Aphis* is brought forth, and is completely diſengaged, it inſinuates itſelf under the body of its mother, and places itſelf cloſe to its elder brother or ſiſter, thus early manifeſting an attachment to that congregated ſtate of ſociety in which it afterwards exiſts.

If by ſtriking it you jar the branch of the tree on which *Aphides* are placed, or ſhould a waſp or other large inſect approach them ſuddenly, or rudely, the whole of them as it were in a maſs elevate their bodies and hind legs and put them in motion; and herein appear to conſiſt their whole powers of defence; in this ſtate their very fine white legs, thus elevated, give them a curious filamentous appearance. We have frequently obſerved white incruſtations adhering to different parts of their legs, wings, and bodies.

Oct. 12. Still obſervable in great maſſes on the large branches of the trees.

Many winged males now among them, yet no appearance of copulation. Many pregnant females emigrating from the maſs.

Nov. 8. A fine warm day, after many of violent and long continued rain, the *Aphides* were obſerved to be very much diminiſhed

in

in number. On ſome of the branches they had quite diſappeared, but on others great numbers ſtill remained in maſſes. Diſeaſe was now making havock among them; the bodies of many were ſwollen and diſcoloured. Moſt of them were ſuſpended by the *proboſcis*, ſtill inſerted into the bark of the tree; their juices were of a deep purple or blackiſh hue. Not a Waſp to be ſeen, but few Flies, and fewer *Coccinellæ*, the only natural enemy to which we have obſerved this ſpecies to be ſubject.

Nov. 10. On opening the abdomen of one of the largeſt females, I counted ſixty-one young, large and ſmall.

Put by in three ſeparate pill-boxes, placed in a warm cloſet to the ſouth-weſt, many large pregnant apterous *Aphides*, and many males with their wings perfectly expanded, and others with their wings not expanded.

The large apterous *Aphides* depoſited young in the boxes, but all of them died in leſs than a fortnight. Theſe ſeveral *Aphides* were placed in this ſituation to ſee if they would live through the winter, as they would be out of the reach of froſt.

Nov. 21. Opened the body of a female *Aphis*, and found it to contain forty-ſix young; three parts of theſe at leaſt were ſuch, and the ſmalleſt of them had more the appearance of embryos than eggs.

At the cloſe of the month of May 1799, after a very long and hard winter, plants were more free from *Aphides* than uſual; yet, in ſheltered gardens particularly, I found them on the top ſhoots of trees, (none on herbaceous plants) as the currant, gooſeberry, apple, cherry, and common ſpindle tree. As yet, few of them had wings. It would appear from this circumſtance, that the female muſt lay her eggs in hard winters on the extremities of the branches.

Obſerved the excrement of a black *Aphis* clear and tranſparent, but the liquor from the tubular *Cornicula* was of a purple colour.

It appears that the excrementitious fubftance both of this black *Aphis* and the common green one cryftallizes foon after it is evacuated at this feafon of the year; for we obferve a white fubftance on the leaves where the *Aphides* are, and fcarcely any of the gloffy honey-dew.

At twenty minutes paft fix in the evening of May 31ft, I immerfed fome black *Aphides* in water, with the leaves of the *Evonymus europæus* on which they were feeding, in two feparate glaffes of water, and took them out at ten. All furvived the experiment.

At twelve at noon I immerfed fome common green *Aphides* on goofeberry fhoots, and a black fort on *Evonymus*, in water; when taken out at twelve at noon next day they were found every one dead.

TAB. V. fig. 1. reprefents part of a branch of the *Salix viminalis* with a number of fpecimens of the *Aphis falicis.*

———fig. 2. is a female of the fame fpecies magnified, in the act of excluding its young.

V. *Remarks*

1
1
1
2
d
C
c
B
b
A
a

V. *Remarks on the Genera of Pæderota, Wulfenia, and Hemimeris.* By *James Edward Smith, M. D. F. R. S. P. L. S.*

Read October 7, 1800.

THE genus of *Pæderota* was firſt conſtituted by Linnæus in his Academical Diſſertation entitled *Plantæ rariores Africanæ*, publiſhed at Upſal in 1760, and reprinted in the 6th volume of the *Amænitates Academicæ* in 1763. In the former edition the genus was called *Hemimeris*, in the latter *Pæderota*, and the only ſpecies there mentioned bears the trivial name of *bonæ ſpei*. This plant has never been well known to botaniſts in general. The original ſpecimen probably remained in Profeſſor Burmann's hands, along with the other plants deſcribed in the above-mentioned diſſertation; but Linnæus, I know not at what period, obtained another, which is preſerved in his herbarium with the name of *b. ſpei* in his own hand, and which he afterwards deſcribed in the *Supplementum* as *Hemimeris diffuſa*. Unfortunately he neglected to quote *Pæderota bonæ ſpei* as a ſynonym in that work, and his ſon, with all the materials before him, totally overlooked it; ſo that Profeſſor Murray, and other compilers, give us the ſame plant under both names. Even M. De Juſſieu ſeems not to have known this original ſpecies of *Pæderota*. His ideas of the genus are taken from the *Buonarotta* of Micheli, and the *Pæderota lutea* of Scopoli, the former of which is referred to *Pæderota* by Linnæus in the 2d edition of *Sp. Plant.* by the name of *P. Buonarota*, and the latter is called in his 2d *Mantiſſa*, *P. Ageria*. Theſe plants appear again in the *Supplementum*, with new and improved ſpecific characters, under the names of *P. cærulea* and *P. lutea*, and their old

old denominations not being there quoted, each of them occurs twice in Murray's and Gmelin's editions of the *Syſtema*; but ſuch repetitions are too frequent in both thoſe writers to excite our wonder at preſent. M. De Juſſieu obſerves, very juſtly in my opinion, that the *Wulfenia* of Jacquin agrees in genus with theſe laſt-mentioned plants. This being the caſe, and as they by no means agree with the original *Pæderota*, it would be beſt to range them under that of *Wulfenia*, a name which has every poſſible claim to be retained. *Pæderota* may very well be ſpared. The plant which firſt bore that name was *previouſly* called *Hemimeris*, as I have already obſerved, and is now ſo denominated in the *Supplementum*, along with two others that accord with it in genus. If the name *Wulfenia* ſhould be refuſed to the plants to which I would apply it, they muſt be called *Buonarotta*, merely on account of priority; for I know of no other claim to ſuch an honour in the Florentine ſenator after whom Micheli named them.

The generic characters of *Wulfenia* and *Hemimeris* may be expreſſed as follows:

WULFENIA.

Diandria Monogynia, next to Veronica.

Corolla tubuloſa, ringens. *Calyx* quinquepartitus. *Capſula* bilocularis, quadrivalvis.

The ſpecies are,

1. *W. Buonarotta*, caule folioſo, corollæ labio ſuperiore indiviſo.
2. *W. Ageria*, caule folioſo, corollæ labio ſuperiore emarginato.
3. *W. carinthiaca*, caule nudo, foliis crenatis.

HEMIMERIS.

Didynamia Angioſpermia, next to Antirrhinum.

Calyx quinquepartitus. *Corolla* rotata, reſupinata, baſi gibboſa, hinc fiſſa. *Filamenta* glabra. *Capſula* bilocularis.

The

The only ſpecies I have hitherto aſcertained are the following:

1. *H. ſabuloſa* diandra, foliis oppoſitis pinnatifidis, caule proſtrato.
2. *H. diffuſa*, didynama, foliis alternis oppoſitiſque pinnatifidis, caule patulo.
3. *H. montana*, diandra, foliis ovatis ſerratis obtuſiuſculis, caule erecto.
4. *H. urticifolia*, didynama, foliis ovatis ſerratis acutis, caule ſuffruticoſo, capſulis retuſis.
   Celſia urticifolia. *Curt. Mag. t.* 417.
5. *H. linearis*, didynama, foliis lineari-lanceolatis ſubſerratis, caule ſuffruticoſo, capſulis acutis.
   Celſia linearis. *Jacq. Ic. rar. v.* 3. *t.* 497. *Curt. Mag. t.* 210.

The three firſt I know only from ſpecimens in the Linnæan herbarium. The *diffuſa* is ſuſpected by the younger Linnæus to be a variety of the *ſabuloſa*, to which I can ſcarcely aſſent. It is not eaſy to ſay which of the two may be the original *Pæderota bonæ ſpei*. The ſpecimen of Linnæus ſo marked is the *diffuſa*; but he had not that before him when he wrote the diſſertation upon rare African plants, and it has certainly four ſtamina. If the number of ſtamina be conſtant, the *ſabuloſa* (which has but two) muſt have been the real *Pæderota*. The *montana* is ſufficiently diſtinct in habit and character from both.

The two remaining ſpecies are natives of Peru, and have for ſome time been commonly known in our gardens as ſpecies of *Celſia*, but certainly without foundation. The error originated with Profeſſor Ortega, and he has been followed by Jacquin and Curtis againſt their own judgment, for neither of theſe plants has the habit or character of any *Celſia*. It is to be lamented that ſuch erroneous names ſhould be ignorantly given and heedleſsly retained, as it is difficult to eradicate them when once applied to any very popular and ornamental plant. Thus a moſt beautiful *Chelone* has been

lately brought from Spain by the ſpecific name of *ruelloides*, and it is ſo called amongſt us: but a more prepoſterous blunder was hardly ever made in botany, as thoſe who know the plant, and can read Linnæus's *Supplementum, p.* 279, will readily perceive. With reſpect to the two ſpecies of *Hemimeris* in queſtion, they perfectly accord with the generic character given above, with which alſo the Linnæan *ſabuloſa* and *diffuſa*, (which I have carefully macerated and diſſected), and to all appearance the *montana* alſo, perfectly agree. In their general habit and ſtructure they alſo manifeſtly form altogether one natural genus.

VI. *An Illustration of the Genus Solandra. By Richard Anthony Salisbury, Esq. F.R.S. and L.S.*

Read November 4, 1800.

CUM in variis amabilis Botanices Scientiæ partibus, id mihi constanter propositum fuit, ut rariores stirpes in horto, si quando fructum maturaverint, eas demum accurate intelligerem, forsan non dedignetur Societas Linnæana observationibus quibusdam quæ *Solandram* illustrent: genus longe pulcherrimum æque ac distinctissimum. "Attamen Angli hanc recepere teste horto Kew," in *Linn. Præl. p.* 392. observat Giseke. Lamarck, in *Journ. Hist. Nat. v.* 1. *p.* 369. asserit, "que ce pretendu genre est une veritable espece de Datura." Utinam sane more parco auctoris Horti Kewensis nova genera reciperent alii Botanici, quippe qui ingenii acumine venerando suo præceptori Linné parum cedens, ne unicum genus, secundum nostrum tantillum judicium, in eo libro inseruit, quod non summo jure distingui debet. Fatendum est autem neque characterem hujusce generis in *Vetensk. Acad. Handl. ann.* 1787. *p.* 301. primo propositum, neque alterum ab eodem auctore in suâ *Fl. Occ. Ind. v.* 1. *p.* 386. nuperrime publici juris factum, omnino attigisse felicitatem, quâ nostris temporibus plures novæ stirpes dignoscuntur. Fructu certe gaudet Daturæ. Folia vero constanter alterna, nec per paria in ramis florentibus approximata, inflorescentia, corolla irregularis cum æstivatione limbi, hæc omnia a veris *Solaneis* adeo late recedunt, ut multo potius in proprio Ordine, cum consimilibus stirpibus Brunsfelsiâ, et Crescentiâ, locarem. Affinitatem cum Besleria video nullam.

SOLANDRA.

Torus medioliformis. *Calyx* margine tori infertus, tubulofus, perfiftens. *Corolla* margine tori inferta: limbo ventricofo, irregulari, fubæftivatione imbricato; decidua. *Filamenta* 5, ore tubi inferta, verfus latus inferius fecunda. *Pericarpium* fuperum, pene totum 4-loculare, fucculentum, deciduum. *Semina* receptaculo longe ftipitato, centrali, profunde 2-lobo, undique feffilia.

Solandra grandiflora. *Swartz Fl. Ind. Occ. v.* 1. *p.* 386. *t.* 9. Solandra grandiflora. *Mæn. Exot. Bot. t.* 6. Solandra grandiflora. *Swartz in Vetenfk. Acad. Handl. ann.* 1787. *p.* 300. *t.* 11. Stramonium fcandens, flore luteo. *Plum. Ic ined.* Peach-coloured trumpet flower, *Jamaicenfibus.*

Sponte nafcentem in Inf. *Jamaica*, in truncos arborum fæpe parafiticam fiffurifque rupium, legit O. Swartz.

Floret *Januario*, *Februario*, fructum maturans *Augufto.*

Frutex 9—20 pedes altus. *Radix* fufca, longe excurrens, ramofiffima, fpongiofe lignofa. *Caulis* cinereus, fcandens, teres: Rami multi, varie flexi, alii longiffimi: plus minus radicans, rimofus; fuperne pallide viridis, vifcido-pubefcens; fpongiofe lignofus. *Folia* denfa, alterna, frondofa: Petioli viridi-purpurafcentes, recurvuli, femiteretes, vifcido-pubefcentes, fupra concavi lineâ medio eminente: Laminæ fupra virides, fubtus pallidiores, petiolis multo longiores, recurvo-patentiffimæ, obovato-lanceolatæ, integerrimæ, acuminatæ, utrinque vifcido-pubefcentes, paululum lucidæ, planiufculæ, carnofæ: Nervi plures, medius craffior petioloque confluens: quotannis prodeuntia et decidua. *Flores* fragrantes, nutantes, folitarii, rarius 2 vel 3 fafciculati. *Pedunculi* pallide virides, ramulis terminales, craffi, 4-5 lineas longi, obconici, infertione articulati, minutiffime vifcido-pubefcentes. *Torus* pallide viridis, pedunculo confluens quo brevior et craffior, medioliformis, obfolete angulatus,

 minutiffime

minutiſſime viſcido-pubeſcens. *Calyx* pallide viridi-purpuraſcens, margine tori inſertus, 3 pollices longus vel plus, erectus, tubuloſus, 5-angulus lateribus concaviuſculis, ſub floreſcentiâ per angulos duos vel tres breviter & inæqualiter fiſſus, poſtea fructu intumeſcente ſæpe profundius uſque ad baſin: laciniæ erectæ, ſemilanceolatæ, integerrimæ, acuminulatæ: minute viſcidulo-pubeſcens potiſſimum intus, extus nonnihil lucidus, perſiſtens. *Corolla* margine tori inſerta, 7-8-pollices longa: Tubus pallide viridi-flavus, calyce parum brevior, verſus latus ejus inferius declinatus, inferne vix 3 lineas diametro, ſuperne ſenſim dilatatus, 5-gonus, ad inſertionem filamentorum extus depreſſiuſculus: Limbus maximâ parte albidus, tubo multo longior; inferne infundibuliformis; mox admodum ventricoſus fauce circiter 2 pollices diametro; dein recurvus ore ſummo 4½ pollices diametro, breviter 5-fidus; per indiviſam partem obſolete 10-angulus, angulis 5 ab inferioribus tubi continuatis intuſque Vittâ obſcure purpureâ coloratis, 5 ab inſertione filamentorum enatis multo tenuioribus intuſque Vittâ obſoletiſſimâ vel nullâ: Laciniæ extus læte purpuraſcentulæ interſtitiis baſi minute ſuborbicularibus, exquiſitiſſime ciliatæ; 1 extima, ſemiorbicularis, repandula, plana; 3 interiores majores latere altero quod æſtivatione includitur dilatato inciſo-crenato criſpoque; 1 intima, maxima, ſemiorbicularis, tota elegantiſſime criſpo-crenulata: inferne extus glabra, cæterum lævis, coriacea, decidua. *Filamenta* 5, pallidiſſime viridi-flava baſibus obſcure purpureis, ore tubi inſerta, decurrentia, limbo circiter dimidio breviora, deorſum ſecunda, incurva, approximata, ſubulata, glabra. *Antheræ* pallidiſſime viridi-flavæ lateribus purpureis, baſi inſertæ ibidemque breviter 2-fidæ, filamentis longe breviores, erectæ, nonnihil lunulatæ, 4-angulæ, mucronulatæ, 2-loculares: Valvæ 4, 2 anteriores paulo anguſtiores et rectiores: lateraliter dehiſcentes; poſt antheſin obſcure purpureæ, paulo minores, inæquilateraliter

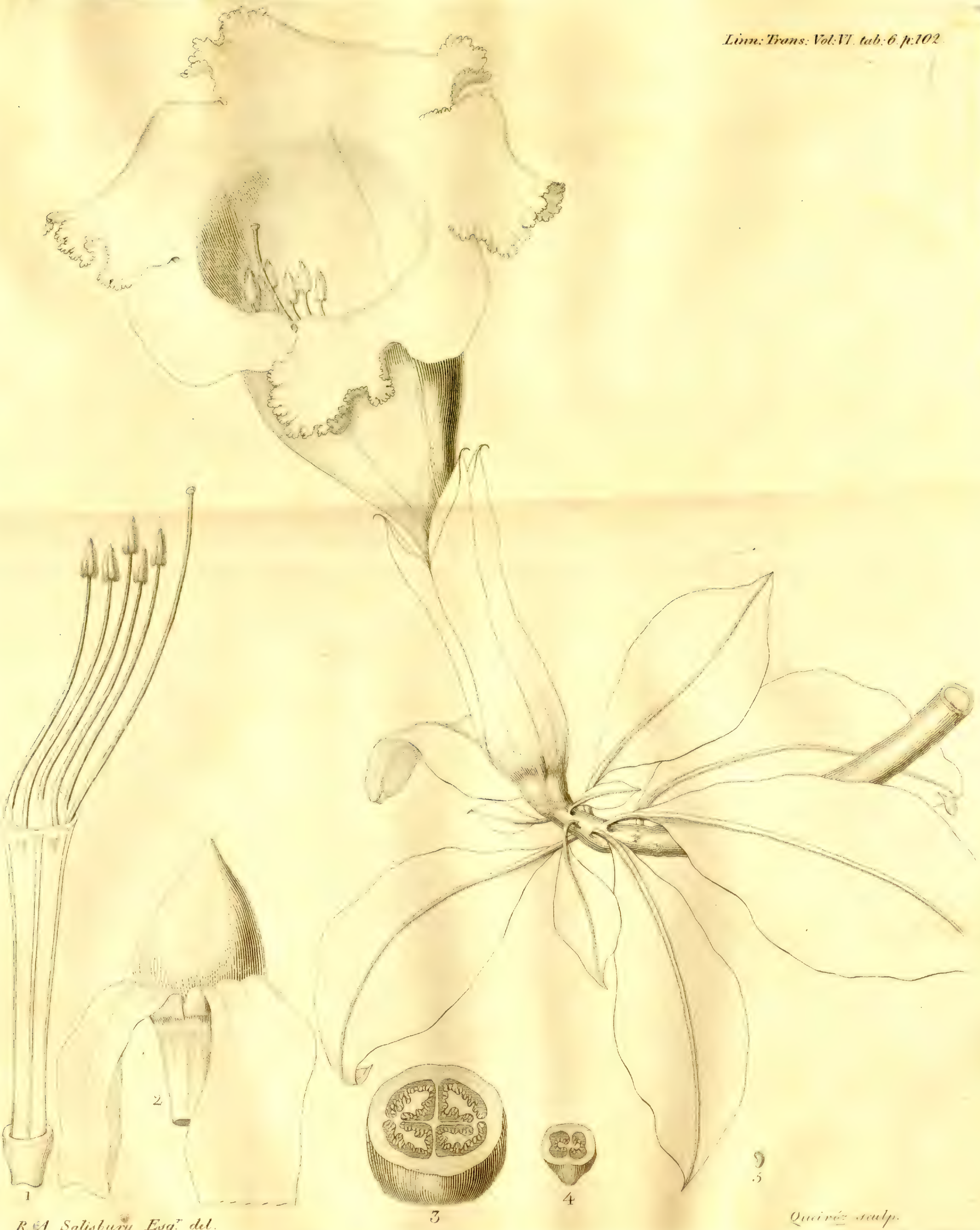
quilateraliter ovatæ, valde compreſſæ. *Pollen* pallidiſſime flavum. *Pericarpium*: caſtum pallidiſſime viridi-flavum, diſco tori ſuperum, pyramidale, læve: gravidum 1½-2 pollices longum, ovatum, fere uſque ad apicem 4-loculare, dein ſeptis 2 parietalibus ſenſim deficientibus 2-loculare; receptacula 2, centralia, longe ſtipitata, profunde 2-loba, varie repando-ſinuoſa: parturiens ſucculentum, deciduum, putreſcens. *Stylus* apice purpuraſcentulus, directione filamentorum quibus tenuior et altior, teres, glaber. *Stigma* pallide viride, compreſſum, minutiſſime pubeſcens, tenuiter canaliculatum. *Semina* plurima, ferruginea, receptaculo undique ſeſſilia, reniformia, 2-cotyledonea.

Conſiſtentiam fructus in uno eodemque genere, admodum variare tot docent exempla, ut vix unquam iſtâ ſolâ notâ plantam abludentem ab affinibus ſepararem: ſtructuram ejus contra, in diverſiſſimis generibus ſimillimam eſſe, multæ aliæ ſtirpes Claſſis 8-væ *Juſs. Gen.* præter hanc de quâ ſupra agitur, probant.

EXPLICATIO TAB. VI.

Fig. 1. Corollæ tubus cum inſertione genitalium.
2. Pericarpium ſubmaturum.
3. Idem juxta medium tranſverſe ſectum, ubi 4-loculare.
4. Idem juxta apicem ubi 2-loculare.
5. Semen maturum.

VII. *Obſerva-*



R. A. Salisbury Esq.r del.

Queiróz sculp.

VII. *Obſervations on ſome remarkable Strata of Flint in a Chalk-pit in the Iſle of Wight, in a Letter from Sir Henry Charles Englefield, Bart. F.R.S. to John Latham, M.D. F.R.S. and L.S.*

Read April 1, 1800.

DEAR SIR,

AS you conſidered the ſpecimens of flint which I ſhowed you worthy of the notice of the Linnean Society, I tranſmit them to you, together with ſuch an account of the ſituation in which I found them, as may perhaps lead to a gueſs of the cauſes of their preſent very extraordinary condition, and will at leaſt ſerve as a guide to thoſe who may wiſh at a future time to inſpect the curious pit where I found them.

Before I enter on the particular deſcription of that ſpot I cannot help ſaying a few words on the lithology of the iſland in general, which has not, that I know of, been deſcribed, as it highly deſerves, by any naturaliſt. Had I been equal to ſuch a taſk opportunities of obſervation were wanting, and the phænomenon which I am about to deſcribe was diſcovered by me ſo ſhort a time before I quitted the iſland that I had not time to inſpect more than one pit beſides that in which I firſt obſerved it.

The Iſle of Wight, which is nearly of a rhomboidal form, lies with reſpect to its four angles, almoſt abſolutely in the four points of the compaſs. It is divided into two very nearly equal parts by a range of chalk hills, whoſe general direction is due eaſt and weſt. Theſe hills do not, however, lie in a ſtraight line, nor are they at all

6 of

of equal breadth or height throughout their extent. At Bembridge, where they form the eaſtern point of the iſland, they riſe abruptly from the ſea to a height of about 400 feet; and, bending a little to the northward, they continue of nearly the ſame elevation and a very narrow breadth, till they terminate at the valley through which the Medina runs. To the weſt of the Medina the range grows conſiderably wider, and is ſubdivided into ſeveral ſubordinate vallies. This additional breadth gives the ſouthern limit a great curvature to the ſouth, while the northern line remains nearly ſtraight. Their elevation increaſes much, and at Mottiſton is 700 feet. The acute and perpendicular promontory in which they terminate to the weſt, well known by the name of the needles, is nearly as high as Mottiſton. Beſides the valley of the Medina this range is ſingularly interrupted by two vallies exactly ſimilar to each other at the two ends of the iſland. Brading Haven renders Yaverland at the eaſt almoſt an iſle, and the Yarmouth inlet cuts off the weſtern end ſo nearly that at high tides it is ſometimes quite inſulated at Freſhwater Gate.

To the north of this range of chalk hills the ſoil is chiefly clay, with a ſuperſtratum, in many parts, of gravel. The clay is interſperſed with many beds of ſtone of different qualities, and which appear to lie in great confuſion. Of theſe ſome are grit with a ſlight admixture of calcareous matter; others have nearly equal parts of ſand and lime, and others are purely calcareous. In the firſt, which are of great hardneſs, very few extraneous bodies appear. In the ſecond are many fine impreſſions of ſhells, while the laſt are almoſt entirely compoſed of moulds of turbinated ſhells ſo as to appear quite honeycombed by them. This ſtone is, however, of great durability, for the walls of Cowes Caſtle, which was built by Henry VIII. and is expoſed to the ſea air from the weſt and north, are as perfect as on the day in which they were built. Below all theſe

ſtrata

ſtrata of ſtone, at Eaſt Cowes, and juſt above a bed of black and ſolid clay, is a ſtratum of ſhells about two feet thick, of which a ſpecimen accompanies this, and which is totally compoſed of theſe ſhells without any admixture or earth whatever. As the ſea makes great inroads here, vaſt heaps of theſe ſhells lie on the beach, and ſeem juſt waſhed up by the waves, inſtead of being torn from their bed in the cliff. They appear nearly in the ſame ſtate as thoſe on the Hampſhire coaſt, which have long been famous among naturaliſts. In the bed at Eaſt Cowes there appears however no variety; for I could ſee no ſpecies but what are here exhibited.

Whatever confuſion in the ſtrata appears to the north of the chalk range, or in that range itſelf, diſappears to the ſouth of it, where the ſtrata are nearly in a horizontal poſition, and ſingularly regular and undiſturbed. The ſea coaſt from Bembridge ſouth to the Needles, except in the ſmall extent of Sandown Marſh, is every where higher than the immediately contiguous land of the iſland, and to the ſouth-eaſt riſes into a vaſt range of hills running from Dunnoſe weſt to St. Catherine's. The ſubſtratum of theſe hills ſeems every where to be clay lying in ſtrata of different colour and purity. The loweſt is black and very hard; approaching to ſhale. Above this ſome ſtrata have a great mixture of ſand, and take the appearance of a ſoft ſtone breaking into very regular cubical forms. Theſe ſtrata extend over the whole ſouthern part of the iſland, and terminate againſt the chalk range very ſuddenly. Above the clay ſtrata is a bed of ſtone in thin layers, and of very mingled materials, but in general very hard. Great quantities of chert or flint nodules appear in this ſtone. The general thickneſs of the ſtratum is from 150 to 200 feet. Above this the higheſt hills of the range have a ſtratum of chalk, not pure or white as that of the chalk range properly ſo called, nor producing flint ſo black.

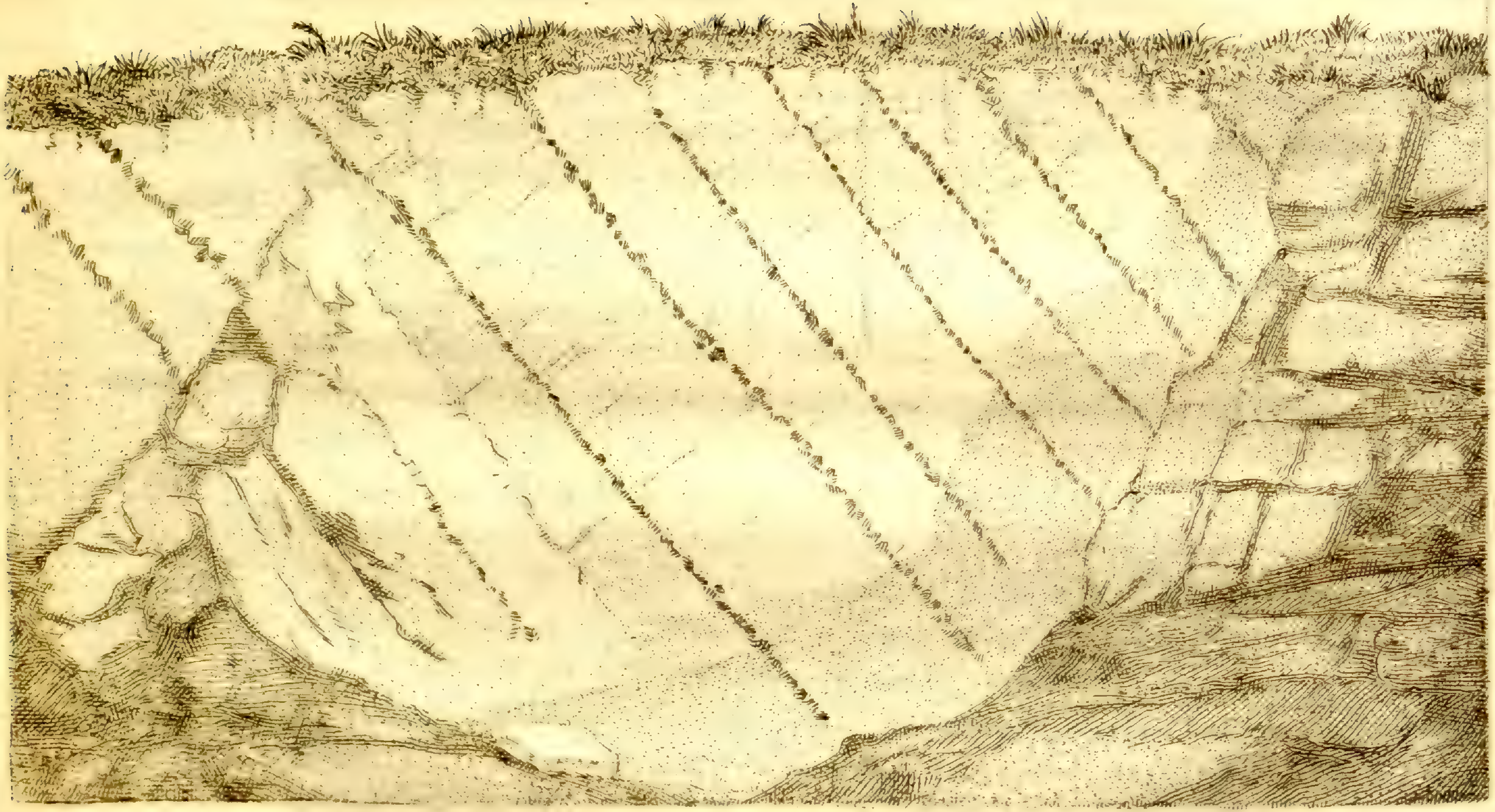
The height of Dunnoſe is 800 feet above low water mark. St. Catherine's hill is at leaſt 850. Of the former I had no opportunity of examining accurately the thickneſs of the ſtrata; but at St. Catherine's the ſtrata are as follow:

Chalk	-	250 feet
Stone	-	200 feet or perhaps not quite ſo much.
Clay and ſand		400 feet
		850

This arrangement accounts entirely for the formation of that ſingular coaſt called the Undercliff, which extends from Dunnoſe to St. Catherine's, and is compoſed of the confuſed fragments of the upper ſtratum of rock which have given way and rolled down as the ſubſtratum of clay has been waſhed away by the ſea. In moſt parts the proceſs ſeems nearly at a ſtand; the coaſt being now protected by the fallen rocks; but at St. Catherine's great devaſtation is ſtill taking place. The earth-fall mentioned laſt year was a very ſmall operation of this kind when compared with the relicks of former convulſions.

From this ſhort ſketch of the general poſition of the ſtrata in the iſland, I return to the particular ſubject of the preſent paper.

The chalk pit, which I am about to deſcribe, is ſituated on the northern edge of the chalk range juſt out of the village of Cariſbrook, and about an hundred yards beyond the diviſion of the roads to Yarmouth and Shorwell. The pit is open to the eaſt. The ſtrata of chalk are very regular, from two to five feet in thickneſs, and divided by ſeams of flint from ſix inches to nine inches in depth. The flints are, as uſual, in nodules of different ſizes, from the ſize of the fiſt to twice the ſize of a man's head. The whole dip northward with an inclination of at leaſt 67 degrees. Perpendicular fiſſures run through the whole from north to ſouth, the ſides of which



which are nearly as flat and smooth as a wall. As these fissures are followed with convenience in working the pit, an extensive face was laid open when I saw it, and the appearance was as in the annexed sketch. See Tab. VII. On examining the beds of flint nearly, I was astonished to find that every flint, though lying in its place, and retaining perfectly its original shape, was more or less burst and shattered; some few were only split into large pieces, but the greater part were broken into small fragments, and some absolutely reduced to impalpable powder. From one which had suffered the most the annexed specimen was taken. The powder was so very fine that I had conceived it must have been mixed with chalk; but, on washing it with diluted marine acid, I found that it was purely siliceous. Indeed the chalk which surrounds these flints is uncommonly solid, and does not exhibit cracks or marks of any violence except the great fissures beforementioned. A specimen of the flint powder after washing in the acid is sent with the other.

I must observe that I had but imperfect opportunity of inspecting the flints which lay at a distance from the fissure; such however as I could see in the bed then working appeared to have been less shattered in proportion as they were more remote from the fissure; but all had suffered more or less.

About 200 yards below this pit, and nearer to Carisbrook village, the road is in part cut through the chalk, and the beds of flint exposed by that means exhibit the same appearances as those in the pit above.

The chalk pit above Shide Bridge, which is the only one I had an opportunity of examining after my discovery of the phænomenon above described, presents in some degree the same appearances, but does not afford so good an opportunity of viewing the strata as that at Carisbrook. The strata did not appear to me to lie so regularly

nor the flints to be diſpoſed ſo much in beds as at Cariſbrook. They were however extremely broken and ſhattered, and apparently the moſt ſo where they lay moſt in ſtrata. The ſtrata had alſo a great inclination or dip to the north.

Although it would be raſh to attempt to account for this very ſingular ſtate of deſtruction of the flints in the Cariſbrook pit, yet it is impoſſible not to offer ſome conjectures on the ſubject. There can be very little doubt that the ſtrata, though now ſo inclined, were originally formed in a horizontal poſition. When the tremendous convulſion took place which ſunk them to the ſituation in which they now appear (at which time the channel which ſeparates the Iſle of Wight from the main land was perhaps formed), the ſtrata of chalk, in the act of ſubſidence, had a tendency to ſlide on each other, and this would be exerted moſt ſenſibly where from the admixture of the flints the coheſion of the parts of the chalk was the weakeſt. This motion, or rather ſtrain, of ſo enormous a weight, might in an inſtant ſhiver the flints, though their reſiſtance ſtopped the incipient motion; for the flints, though cruſhed to powder, are not diſplaced, which muſt have been the caſe had the beds ſlid ſenſibly. This conjecture is perhaps ſtrengthened by what I obſerved in a few detached nodules of flint in the chalk ſtrata which did not appear to have ſuffered as thoſe in the beds of flint have done. I may here add that it ſeemed as if in ſome places the fine powder of the flints had run down, and inveſted the nearer parts of the fiſſure with a thin coating of the agglutinated duſt; but this may poſſibly have taken place ſince the face of the fiſſure has been expoſed to the weather.

Perhaps it may not be totally foreign from the preſent ſubject, to mention that in a very great chalk pit at the village of Preſton, a mile north of Brighthelmſtone, in which the flints lie in very regular and nearly horizontal ſtrata, but which has alſo vaſt perpendicular

fiſſures in the chalk, the fiſſures are in many places filled to a conſiderable extent with a very thin vein of pure flint exactly as if the flint, not being quite hard when the fiſſures took place, had been ſqueezed out of the beds and run into the fiſſures as ſoft pitch would do. I do not mean at all to ſay that this was the caſe, but merely to deſcribe the appearances. In the chalk pit juſt below the church at Brighthelmſtome another ſingular appearance may be ſeen. The upper part of the chalk is in ſeparate maſſes, not properly rubble, but with all their tender angles ſharp exactly as if juſt broken to pieces to put into the lime kiln, and quite clean, nearly of a ſize, and almoſt without any chalk powder mixed with them.

I remain, &c.

Southampton, Jan. 22, 1800.

VIII.

VIII. *Remarks on ſome Britiſh Species of Salix.* By *James Edward Smith, M.D. F.R.S. P.L.S.*

Read May 5, 1801.

IT has for a long time been my intention to offer to the conſideration of the Linnean Society ſome elucidation of the Britiſh Willows; but there are many reaſons why any thing like a complete hiory of of the genus of *Salix* cannot at preſent be made out, even ſo far as regards our native ſpecies, and I have therefore withheld the partial information I had acquired, in hopes of learning more, and being able to communicate ſomething better worth the Society's acceptance.

At length however it becomes neceſſary that this obſcure genus ſhould aſſume as regular a form as poſſible in the *Flora Britannica*; where, as in every other inſtance, my object is to publiſh nothing that I have not aſcertained myſelf, at leaſt as far as the imperfection of all human knowledge and judgment will permit. The enumeration therefore of the ſpecies of *Salix* in that book, though more comprehenſive than any yet publiſhed in Britain, will be but an eſſay, to be perfected hereafter; and what I have to offer in this paper are various matters collected in the courſe of my inquiries, which require a more diffuſe explanation than the ſyſtematic form of the work juſt mentioned will admit. I ſhall at preſent confine my obſervations to the arboreſcent ſpecies of the firſt ſection of the genus *Salix*, which comprehends ſuch as have leaves more or leſs ſerrated, and nearly ſmooth, at leaſt when fully formed. This is the

most difficult section, and I flatter myself I shall be able to furnish some new information respecting it.

Some difficulties which attend the investigation of this genus are almost peculiar to it. Willows to be well understood require to be studied at three different periods of their growth; first when in flower, at which time the leaves in general scarcely appear at all; next when the capsules are fully formed and nearly ripe, and the leaves just expanded, with their stipulæ; lastly when the leaves have attained their full size, and all remains of the fructification have disappeared. In this last state the true form, and pubescence or smoothness, of the leaves is to be known; in the second the nature of the *stipulæ*, which frequently are very deciduous, and the figure and surface of the capsules; whereas in the first state the very discriminative and curious parts of the flower, the stamina, nectaria, and, above all, the proportion and structure of the germen, style and stigmata, are only to be learnt. I have found the last-mentioned parts so constant and important, so strongly indicative of natural subdivisions of the genus, that if we could at all times command them, they would certainly afford better characters for that purpose than the margin or pubescence of the leaves. But the dioecious nature of these plants is another inconvenience, and peculiarly militates against a general arrangement of them according to parts, which it is an even chance whether we meet with or not, and which are moreover so very transient.

If I should prove more successful in treating the subject under consideration than my predecessors Mr. Hudson and Mr. Lightfoot, it will be greatly owing to three causes. First the publication of Professor Hoffman's *Historia Salicum*, so full, so accurate, I might almost say so perfect, as far as it goes. This work the authors of the *Flora Anglica* and *Flora Scotica* never knew. In the next place the opportunity I have had of studying the Linnæan original specimens,

in

in this genus peculiarly ample and inſtructive, and of comparing them, through Her Majeſty's gracious permiſſion, with Mr. Lightfoot's Herbarium, by which moſt of the doubtful ſpecimens mentioned in his *Flora*, p. 611, have been referred to ſome ſpecies or other, and all his difficulties with regard to others removed. Laſtly the aſſiſtance I have received from my accurate and indefatigable friend Mr. Crowe, who for many years has with unwearied diligence collected Willows, both indigenous and exotic, from all quarters; carefully noting their peculiar uſes and properties; diſtinguiſhing the truly wild from the naturalized, or merely cultivated kinds; and watching them with a moſt diſcriminating eye through all their ſtages of growth in his garden, which is fortunately ſituated ſo as to be peculiarly favourable for the purpoſe.

Linnæus begins his arrangement of the *Salices* with thoſe ſpecies which have ſome peculiarity in their ſtamina, and our Britiſh writers follow him in this diſtribution. It is not my deſign to diſturb it. All ſuch as, inſtead of the 2 diſtinct ſtamina of Willows in general, have their filaments united into one, or have more than 2 ſtamina, have ſmooth ſerrated leaves, and therefore ſtand commodiouſly enough at the head of this firſt ſection.

The *Salix hermaphroditica* I believe has no right to a place among Britiſh plants. Hudſon introduces it only with a mark of doubt. The *Salix latifolia folio ſplendente* of Ray ſeems, by Dillenius's remark, to be a variety of the Sallow. The real *hermaphroditica* of the Linnæan herbarium is cloſely allied to *S. pentandra*, except in the fructification, and has never been detected in Britain. All that I have found in the gardens under that name is merely a broad-leaved variety of *S. pentandra*, the flowers of which are pentandrous and dioecious. The true *hermaphroditica* has but 2 ſtamina, and thoſe in the ſame flower with the piſtillum. I have never ſeen it alive, nor do I believe it to be known out of Sweden.

The

The first species on our list of British Willows is the

1. Salix *purpurea.*

Bitter Purple Willow.

S. monandra, foliis obovato-lanceolatis serratis glabris, stigmatibus brevissimis ovatis subsessilibus.

Salix purpurea, *Linn. Sp. Pl.* 1444. *Huds.* 427.

S. monandra. *With.* 45. *Curt. Lond. fasc.* 6. *t.* 71. *Hoffm. Sal.* *v.* 1. 18. *t.* 1. *f.* 1, 2. *t.* 5. *f.* 1. *t.* 23. *f.* 1.

S. humilior, foliis angustis subcæruleis, ex adverso binis. *Raii Syn.* 448. *Cant.* 144. *n.* 5.

In palustribus, et ad fluvios. Fl. Martio.

This is a bushy shrub, three or four feet high, with long, slender, tough, purple, shining branches. The leaves are either opposite or alternate, nearly linear, but broadest upwards, serrated chiefly towards the summit, very smooth, glaucous beneath, destitute of stipulæ. The male catkins are very slender, scarcely an inch long, nearly sessile, consisting of many thick-set flowers, the uppermost of which expand first. Scales black at the tip, hairy. Nectary a solitary gland opposite to each scale. Stamen one solitary simple filament, never dividing, bearing an orange-coloured double, or four-lobed, anthera. Female catkins exactly like the male in size and form. Germen sessile, small, of an ovate or rather elliptic form, silky. Style very short, or scarcely any. Stigmas small, sessile, somewhat ovate, undivided, marked with a longitudinal furrow on the upper side. Capsule ovate, small, silky.

The leaves and twigs of this species are extremely bitter, and therefore authorize the English name given by Mr. Curtis, who has

well figured and defcribed the fpecies, though he erred in confounding it with the following.

2. SALIX *Helix.*

Rofe Willow.

S. monandra? foliis lanceolatis acuminatis ferrulatis glabris, ftylo elongato filiformi, ftigmatibus linearibus.
Salix Helix. *Linn. Sp. Pl.* 1444. *Hudf.* 427. *Dalech. Hift.* 277. *f.* 2.
S. n. 1640. *Hall. Hift. v.* 2. 306.
Salicis racemi feu nucamenta, rofæ et capitula fquamata. *Bauh. Hift. v.* 1. *p.* 2. 213.

In falicetis et paluftribus. Fl. Martio, Aprili.

Haller and Ehrhart feem to have led Prof. Hoffmann into the error of confounding this with the preceding, from which it is moft unqueftionably very diftinct. Mr. Curtis, and fome of our more recent writers, have followed Hoffmann, perhaps without having ever feen the true *S. Helix.* I am obliged to Mr. Crowe for firft pointing out to me the different heights of the two plants, and different fizes of their catkins, and on a critical examination of the female flowers, I was fo fortunate as to find further marks of diftinction.

S. Helix rifes to the height of 9 or 10 feet, and is a fmall flender tree. Even in the form of its leaves it differs from the *purpurea*, thofe of the *Helix* being more truly lanceolate and taper-pointed, by no means obovate. From the fize which Haller afcribes to his *Salix n.* 1640, I venture to prefume he intended this plant, and not the *purpurea*, and therefore borrow from him the character *monandra*, for I have never feen the male of this fpecies. It is extremely probable moreover, from the clofe affinity of the two in other

refpects, that they fhould agree in this. The female catkins are fomewhat longer, and twice as thick, as in the laft, and ftand on longer ftalks. The germen is feffile, ovate and filky, but the ftyle is confiderably lengthened out, quite fmooth and naked. The ftigmas alfo, inftead of being fhort and ovate, are linear and confiderably elongated. To thefe fatisfactory marks may be added that the leaves are lefs glaucous beneath, and not fo bitter as thofe of the *S. purpurea.*

3. Salix *fiffa.*

Bafket Ofier.

S. monadelpha, foliis lanceolatis acutis fubdenticulatis glabris: fubtùs glaucis.

Salix fiffa. *Hoffm. Sal.* v. 1. 61. t. 13, 14.

In falicetis. Fl. Aprili, Maio.

In feveral ofier-grounds near Lynn, Norfolk. *Mr. Crowe.* At Prickwillow near Ely. *Rev. Mr. Hemfted.* At Fincham, Norfolk. *Rev. Jofeph Forby.*

This is a fhrub 4 or 5 feet high, with upright, flexible and very tough branches, of a yellowifh afh-colour, often purplifh. Leaves alternate, on footftalks, lanceolate, pointed, 2 or 3 inches long, minutely toothed, or fomewhat ferrated, principally towards the top; fmooth on both fides except when very young; glaucous beneath; dark-green above. Stipulæ none. Catkins on fhort ftalks, cylindrical, blunt, firft red, then yellow, flowering firft at the top. Stamina 2, united from the bafe about half way to the top. Antheræ of 2 lobes, yellow. Germen ovate, acute, hairy. Style fhort. Stigmas oblong, blunt, undivided.

This is cultivated in the fens, and preferred above all other Willows or Ofiers for the fineft kinds of bafket work. Female plants only have hitherto come under my infpection, but, by a peculiar inftance of good fortune, I laft fpring met with one or two male flowers at the bafe of a few female catkins in Mr. Crowe's garden. Thefe enabled me to complete my defcription, and at the fame time removed every poffible doubt of our plant being the *S. fiffa* of Hoffmann, with every part of whofe excellent defcription it accords.

4. Salix *rubra.*

Green Ofier.

S. monadelpha? foliis lineari-lanceolatis elongatis acutis denticulatis glabris: fubtùs concoloribus.

Salix rubra. *Hudf.* 428. *With.* 49.

S. virefcens. *Villar's Dauph. v.* 3. 785. *t.* 51. *f.* 30.

S. minimè fragilis, foliis longiffimis utrinque viridibus non ferratis. *Raii Syn.* 449.

S. nerii folio utrinque virente. *Vaill. Par.* 175.

In falicetis rarius. Fl. Aprili, Maio.

Between Maidenhead and Windfor, and near Salifbury. *J. Sherard.* In an ofier-holt near Ely. *Rev. Dr. Goodenough.* At Prickwillow near Ely. *Rev. Mr. Hemfted.* Near Bedford. *Rev. Mr. Abbot.*

The branches of this fhrub are very long, flender, tough, fmooth, gray or purplifh. Leaves about 4 inches long when full-grown, linear-lanceolate, narrow, acute, flightly toothed or ferrated, by no means entire, of a bright green on both fides, not at all glaucous, fmooth in general, fometimes fprinkled with a few flender hairs beneath. Stipulæ, if prefent, linear-lanceolate, a little toothed; but

but generally wanting. The male catkins I have not ſeen. I preſume them from analogy to have monadelphous ſtamina. The females differ but little from the preceding, except in having rather thicker, almoſt ovate, ſtigmas.

This ſpecies appears to be but little known, though among the moſt valuable as an Oſier. The habit of the plant, figure and length of its leaves, agree with the Common Oſier *S. viminalis*; but their bright green colour on both ſides, and want of all pubeſcence, except when very young, render them eaſily diſtinguiſhable from that ſpecies, while their great length, linear form, and narrowneſs, and their colour being not at all glaucous, prevent their being confounded with *S. fiſſa*.

Specimens obligingly communicated by my friend Mr. Lambert, V. P. L. S. from Mr. Hudſon's own herbarium, have removed all uncertainty as to its being his *S. rubra*. The name is leſs appoſite than might have been wiſhed: *virens* or *concolor* would better have expreſſed the peculiar character of the ſpecies. Of the ſynonym of Ray there can be no doubt. That of Vaillant I learned from the Sherardian herbarium.

5. SALIX *Croweana*.

Broad-leaved Monadelphous Willow.

S. monadelpha, foliis ellipticis ſubſerratis glaberrimis: ſubtùs glaucis.

In paluſtribus. Fl. Aprili, Maio.
At Cranberry Fen in the pariſh of Eaſt Winch, and in other parts of Norfolk. *Mr. Crowe.*

This ſcarcely riſes to the height of a tree. The branches are ſhort and ſpreading, rather brittle, clothed with a ſhining yellowiſh

8 or

or purpliſh bark. Leaves on footſtalks, elliptical, or inclining to obovate, ſomewhat pointed, ſcarcely an inch and half long, ſlightly ſerrated or rather crenate, ſmooth on both ſides; bright-green and ſhining above; glaucous and veiny beneath. Catkins nearly ſeſſile, of a ſhort ſomewhat ovate form. Scales obovate, black, very hairy. Stamina pale lemon-coloured, longiſh, their filaments united from the baſe to a greater or leſſer diſtance, ſometimes almoſt to the top. Antheræ reddiſh. The female flowers are as yet unknown.

This ſpecies of *Salix* ſeems to have eſcaped the notice of every botaniſt hitherto, and I have given it the name of its diſcoverer. It is moſt certainly very diſtinct from all others, and eaſily known by its united ſtamina, and ſhort broad leaves. It is deſtitute of the valuable properties of an Oſier, having ſhort and rather brittle, not long and flexible, twigs. It has therefore to all appearance never been cultivated, but is truly wild in Norfolk.

6. SALIX *triandra.*

Long-leaved Triandrous Willow.

S. triandra, foliis lineari-oblongis ſerratis glabris, germinibus pedicellatis.

Salix triandra. *Linn. Sp. Pl.* 1442. *Hudſ.* 425. *With.* 45. *Curt. Lond. faſc.* 6. *t.* 72. *Hoffm. Sal. v.* 1. 45. *t.* 9. 10. *t.* 23. *f.* 2.

S. folio amygdalino utrinque aurito, corticem abjiciens. *Raii Syn.* 448.

In ſalicetis et ad ripas fluviorum frequens. Fl. Maio, etiam Auguſto.

This is naturally a tree 30 feet or more in height, but being one of the beſt Oſiers for the uſe of baſket-makers, is generally cut and kept low. The bark of the ſtem and branches peels off ſpontaneouſly, almoſt like that of the plane-tree. The branches are upright,

right, long, ſlender, pliable and tough, though ſomewhat brittle at their inſertion; their bark is browniſh and ſmooth. Leaves about 3 or 4 inches long, of a linear oblong figure, tapering away towards the baſe, and their breadth on each ſide the nerve is as nearly equal as poſſible; they terminate in a point; their margin is thickly ſerrated, the ſerratures incurved and rounded, a little glandular; both ſides ſmooth, the under rather glaucous. Stipulæ ovate, oblique, crenate, veiny, ſmooth, often wanting. Catkins at the ends of ſmall leafy young branches, erect, ſlender, yellowiſh, with blunt downy ſcales. Stamina generally 3 to each ſcale, very rarely (in the ſame catkin) only 2. Germen ſtalked, ovate, pointed, warty. Stigmas ſhort, ſpreading, notched. Capſule very ſmooth, green.

7. Salix *amygdalina.*

Broad-leaved Triandrous Willow.

S. triandra, foliis ovatis obliquis ſerratis glabris, germinibus pedicellatis, ſtipulis maximis.
Salix amygdalina. *Linn. Sp. Pl.* 1443. *Hudſ.* 426. *Lightf.* 596.
S. folio auriculato ſplendente flexilis. *Raii Syn.* 448. *Cant.* 144.

In ſalicetis et paluſtribus. Fl. Aprili, Maio.
On Badley moor by Dereham, Norfolk. *Mr. Crowe.*

Moſt botaniſts confound this with the preceding, and I ſhould ſcarcely have eſcaped the ſame error but for the obſervations of Mr. Crowe, who was led to inveſtigate their botanical diſtinctions by the different qualities of the two plants for œconomical purpoſes. This is but rarely preſerved in oſier grounds, being a bad Oſier, greatly inferior to the true *S. triandra.* It never riſes into a tree. The bark indeed is deciduous, as in the preceding, which added to the triandrous flowers, perhaps led Mr. Curtis and others to ſuſpect there exiſted

existed no specific difference between the two. The leaves however will sufficiently serve to discriminate them. Those of *S. amygdalina* are shorter, scarcely 2 inches long, of a broadish ovate figure rounded at the base, by no means linear; they are moreover oblique, the width of the two sides being unequal. The stipulæ are remarkably large, varying from a roundish to an half-heartshaped form, crenate, deciduous. Female flowers and capsules much like those of the last species.

8. SALIX *pentandra.*

Bay-leaved Willow.

S. pentandra, foliis elliptico-lanceolatis crenulatis glabris, germinibus glabris subsessilibus.

Salix pentandra. *Linn. Sp. Pl.* 1442. *Hudf.* 426. *With.* 46. *Lightf.* 595.

S. folio laureo, seu lato glabro odorato. *Raii Syn.* 449.

Ad rivos Angliæ septentrionalis et Scotiæ australis. Fl. Maio, Junio.

The sweet or bay-leaved Willow is sufficiently well known by its broad odoriferous leaves, whose serratures exude a copious yellow resin, and its numerous stamina, which are commonly about 5 to each flower. We have only to remark that the variety β of *Fl. Suevica* seems to be a distinct species, not yet found in England.

9. SALIX *nigricans.*

Dark broad-leaved Willow.

S. foliis elliptico-lanceolatis crenatis glabris subtùs glaucis, germinibus pedicellatis lanceolatis acuminatis sericeis.

Salix

Salix phylicifolia *β.* *Linn. Sp. Pl.* 1442. *Fl. Lapp. ed.* 2. 291. *t.* 8. *f.* c. *n.* 350.

In ſalicetis Fl. Aprili.

At Wrongay fen, Norfolk, and in oſier grounds in other places not uncommon. *Mr. Crowe.*

No writer except Linnæus appear to have known Willow, this but he ſurely has erred in making it a variety of his *phylicifolia*, from which it differs in the much greater ſize of all its parts, as well as in the totally different form of its ſerratures, a part ſo peculiarly characteriſtic in the *phylicifolia*.

This ſpecies I have named *nigricans* from the dark colour of its branches, as well as its black hue when dried, which laſt indeed is not abſolutely peculiar to it. The trunk ſcarcely riſes to the height or form of a tree. The branches are upright, round, rather brittle, ſmooth. Leaves 2 or 3 inches long, elliptic-lanceolate, acute, a little rounded at the baſe, crenate in almoſt every part, but more ſlightly in the female plant; dark-green and very ſmooth above; glaucous, veiny, rarely a little hairy beneath. Foot-ſtalks very broad at their baſe. Stipulæ (if preſent) rather large, obliquely heart-ſhaped, ſerrated, ſmooth. Catkins from an inch to an inch and half long, thickiſh, with obovate, brown, hairy ſcales. Stamina 2, diſtinct, more or leſs hairy about their baſe. Style ſhort, ſmooth. Stigmas thick, ovate, united at their baſe, permanent, undivided. Capſules on footſtalks, long and tapering, clothed with white ſilky down, as are the general and partial ſtalks.

The leaves in the female plant are ſhorter, and leſs crenate, as well as more tapering towards the baſe. Such differences between the two ſexes of Willows are rare, but I can hardly conceive theſe to be different ſpecies, as they agree in every part beſides.

10. SALIX *laurina.*

Shining dark-green Willow.

S. foliis ellipticis acutis denticulato-ſerratis glabriuſculis ſubtùs glaucis, germinibus pedicellatis lanceolatis ſericeis.

In ſalicetis et paluſtribus. *D. Dickſon.* Fl. Aprili, Maio.

Very nearly related to the laſt, but certainly a diſtinct ſpecies. It eſſentially differs in the male catkins, which are but half the ſize of thoſe laſt deſcribed, and their ſtamina are ſhorter, perfectly ſmooth, not hairy at their baſe. The leaves alſo are of a brighter green, their margin inclined to be revolute, and rather toothed than crenate. The germen alſo is ſhorter, blunter, and leſs tapering.

Neither of theſe Willows is known to be of any particular uſe. Their branches are not endued with much flexibility or toughneſs.

11. SALIX *petiolaris.*

Dark long-leaved Willow.

S. foliis lanceolatis ſerratis glabris ſubtùs glaucis, germinibus pedicellatis ovatis ſericeis, ſtigmatibus ſeſſilibus bilobis.

In ſalicetis et paluſtribus. *D. Dickſon.* Fl. Aprili.

This ſpecies has not been found wild in Norfolk, but was ſent to Mr. Crowe by Mr. Dickſon, along with the laſt, as of Britiſh growth. It has moſt affinity with the two preceding ſpecies, but has longer and more ſlender twigs. The leaves are 4 or 5 inches long, about an inch broad, lanceolate, pointed, ſerrated, ſomewhat revolute, generally a little unequal at the baſe; bright-green, ſmooth and ſhining above; glaucous beneath, and ſometimes a little

hairy. In drying they turn of a purpliſh black. The footſtalks are peculiarly long, linear, and ſlender, ſilky on the upper ſide. Stipulæ ſmall, creſcent-ſhaped, toothed, ſmooth. The female catkins, the only ſex I have ſeen, are ſcarcely an inch long, with black, hairy, obovate, often notched, ſcales. Germens on long footſtalks, ſmall, ovate, ſilky. Stigmas perfectly ſeſſile, ovate, obtuſe, divided into two lobes.

12. SALIX *phylicifolia.*

Tea-leaved Willow.

S. foliis lanceolatis undulato-crenatis glabris ſubtùs glaucis, ſtipulis ſublunatis.

Salix phylicifolia *α*. *Linn. Sp. Pl.* 1442. *Fl. Lapp. ed.* 2. 291. *t.* 8. *f. d. n.* 351.

In alpibus Scoticis. Fl. Maio.
At Finlarig, Bredalbane. *Rev. Mr. Stuart.*

I am enabled to add this to the liſt of Britiſh plants, by means of a ſpecimen ſent to Mr. Lightfoot by Mr. Stuart, of Luſs, and now preſerved in his herbarium, among others which the author of the Flora Scotica had not ſufficient materials to decide upon. Having confronted with this the original Lapland ſpecimen of Linnæus, I can ſpeak with certainty to their being exactly the ſame. Unfortunately the fructification is wanting in both, but their leaves are ſufficient to mark the ſpecies.

S. phylicifolia appears to be a ſhrub with ſmooth, ſlender, ſpreading branches. Leaves alternate, ſtalked, exactly lanceolate, rather acute, furniſhed, about the middle principally, with broad and unequal crenatures, between which the leaf is as it were almoſt ſinuated; the margin is a little more thickened than ordinary; the baſe

 and

and extremity of each leaf are entire, destitute of glands: all the leaves are either perfectly smooth in every part, or a little sprinkled with minute inconspicuous hairs; dark-green above; glaucous and reticulated with veins beneath. Footstalks slender, smooth. Stipulæ crescent-shaped, mostly serrated, various in size.

To the tribe which this paper is intended to illustrate belong (besides a few smaller species, which have little affinity with those already mentioned) two well-known trees, the *S. vitellina* and the *S. fragilis.* These will have a place in the *Flora Britannica*, though it may be doubted whether the former be really indigenous. As, however, I have nothing new to say concerning them, but, on the contrary, am waiting for more information than I have yet been able to obtain concerning the fructification of both, I will not add to the length of this treatise by any imperfect descriptions. Some remarks of Professor Hoffmann lead me to suspect we may have more than one species in England underthe name of *fragilis*, but that I must leave for future inquiry.

My worthy friend the Rev. Mr. Abbot of Bedford, so well-known to this Society, has favoured me with one, if not two, entirely new English Willows, which belong to this first section of the genus, and which promise to be important in an œconomical view. I lament that the want of their fructification, and a longer time to observe their growth and different appearances, oblige me to postpone any further mention of them at present.

IX. *De-*

IX. *Descriptions of four new Species of Fucus.* *By Dawson Turner, M. A. F. L. S.*

Read May 5, 1801.

ALTHOUGH the numerous individuals comprehended under that extensive family known by the name of *Fucus*, and especially such of them as are considered natives of Britain, have of late years been the subject of much inquiry, and have induced many most able botanists to exert their skill in the investigation of them, it nevertheless requires but a very slight acquaintance with the subject, to be fully persuaded that, without entering into laborious researches upon their internal organization, or the mode of their fructification, things hitherto almost entirely neglected, a wide field remains for future naturalists to display their ingenuity, in the determination of many even of those species which are most abundant upon every part of our Island. I should feel extremely sorry were this, or any similar observation, to be considered as detracting from the merits of those gentlemen, to whose exertions I have always had a pleasure in acknowledging that the science is most deeply indebted:—far from such an idea, my intention is only to say that our knowledge of the marine *algæ* is still in its infancy; and a stronger proof of the justice of this remark can hardly be adduced, than the common *Fucus vesiculosus*, from the varying appearances of which, Linnæus and some subsequent botanists have formed such an infinity of distinct species. Did this circumstance require further confirmation, it might possibly in some degree receive it from a consideration of the four

four plants to which it is my object, in the present paper, to call the attention of the Linnæan Society, and of which two only can properly be said to be either altogether new, or even very uncommon; there being little doubt but the others will be found to be sufficiently abundant, at least upon the eastern shore of England, where their having remained so long unnoticed has arisen only from their having been regarded as varieties of some of their congeners, to which they are in reality very nearly allied. From these authors I should not now venture so openly to differ, or rather should express my sentiments with far greater diffidence, were not the plants which I have undertaken to describe, and upon which I trust that future investigators will confirm my decision, especially natives of the Yarmouth beach; and had not my attention been particularly directed to them, from almost the earliest period that I have made the marine algæ my study, by my instructor and coadjutor Mr. Wigg, upon whose knowledge of them the Society have heard too much from more able as well as more eminent botanists, to make it necessary for me in any wise to enlarge.

I had proposed to myself to extend this paper to a greater length than my contracted leisure will now admit, and, among other plants, to have included in it a figure of *Fucus fruticulosus* of Jacquin, which, in company with Mr. Sowerby, I found not unfrequently upon the shores of the more western counties; the excellent account however of this plant, given by the Baron de Wulfen, made such an intention useless; and I am now induced to mention the circumstance, only from a fear that my having abandoned the idea may have been the cause of leading my friend, Mr. Stackhouse, into error, as, I understand that, in the third fasciculus of his Nereis, the appearance of which may soon be expected, he has declined figuring this species from an idea that it would previously be done by me.

Fucus

Fucus ruscifolius

Fucus crenulatus

FUCUS *rufcifolius.*

F. caule ramofo alato; foliis oblongis obtufis planis integerrimis proliferis: venulis diaphanis catenatis.

TAB. VIII.

Fig. 1. Planta naturali magnitudine.
2. Folii capfuliferi extremitas lente aucta.

Inter rejectamenta maris apud Yarmouth in Norfolciâ. Perennis: Floret Januario Februario.

Radix fibrofo-callofa, furculifera. Frons bipollicaris, membranacea, tenerrima, e bafi ramofa, caule nonnunquam brevi tereti filiformi prædita. Rami membranâ tenuiffimâ utrinque alati. Folia in omnibus quæ adhuc mihi videre contigit exemplaribus, principio ovata, dein oblonga, femper obtufa; e cofta iterum atque iterum prolifera. A Fuco Hypogloffo, cui proximè accedit, primo intuitu dignofci poteft, non modo foliorum figurâ, verùm etiam ftructurâ totâ internâ, præfertimque lineis pellucidis, catenatis, plerumque fimplicibus, quandoque ramofis et anaftomofantibus, quæ a coftâ utrinque copiofe oriuntur, et ad foliorum margines decurrunt, angulum cum coftâ plùs minùs acutum fervantes. Fructificatio, tubercula parva, globofa, in ipfâ coftâ, præcipuè foliorum extremitatem verfùs fita, quorum plurima fæpe in eodem folio: his diffilientibus, feminum minimorum, faturatè rubentium copia fatis ampla ejicitur, et coftæ utrique lateri, feriatim quafi difpofita, adhæret. Color plantæ fanguineus.

The refemblance of this plant to *Fucus Hypogloffum* is fo extremely great, that, though I have been in the habit of obferving it for many fucceffive years, and can point out feveral circumftances in

which they eſſentially differ, I ſhould ſtill have felt very unwilling to deſcribe them as ſpecifically diſtinct, were it not for the curious lines of concatenated veins which I find both peculiar to this ſpecies, and conſtant in all the ſpecimens that have fallen under my obſervation. In a freſh ſtate theſe veins are ſo eaſily viſible, as to give the plant a ſtriated appearance; but when dried, eſpecially if faſtened upon paper, a good glaſs and ſtrong light are neceſſary to diſcover them. I have never been able to form a ſatisfactory opinion upon the office which they are intended to perform in the internal organization of the ſpecies; nor indeed is this a ſubject upon which, in our preſent knowledge of the marine algæ, it would be right to hazard a conjecture. I ſhall therefore content myſelf with obſerving, that they run from the midrib to the ſides of the leaf generally in parellel lines, but ſometimes branching and anaſtomoſing; that they are quite pellucid; and that they are interſected at regular diſtances with joints, like the filaments of *Confervæ*. The colour of *Fucus ruſcifolius* is always much darker than that of *Fucus Hypogloſſum*; the leaves of a different form, and, particularly when young, very blunt; the texture of the membrane, under a powerful microſcope, diſſimilar; the ſtem far ſtronger; and the midrib more prominent as well as more viſible: to which is to be added, that the months of January and February are thoſe in which this plant bears its fruit, and in which it is moſt frequently ſeen upon the Yarmouth beach; whereas *Fucus Hypogloſſum* fructifies only in the ſummer, and never appears at any other part of the year. Hence I conclude, that the one is annual, the other perennial. I have a ſpecimen of *Fucus ruſcifolius* with the root completely fibrous; no tendency to which I ever ſaw in *Fucus Hypogloſſum*; but, this not appearing to be always the caſe, I have not conſidered a ſingle inſtance ſufficiently important to ground any part of the ſpecific diſtinction upon it. In the mode of fructifying, the two plants completely agree; and, as

8 much

much has been already written upon that ſubject, the Society will perhaps excuſe me if I treſpaſs ſomewhat upon their time by a ſlight digreſſion reſpecting it. The fruit of *Fucus Hypogloſſum*, as is well known, is ſometimes found in ſmall globular capſules ſituated upon the midrib of the leaves, while in other ſpecimens no traces of theſe capſules are apparent, but minute dark ſeeds are diſcovered in two ſmall rows on each ſide of the midrib, and parallel to it: a circumſtance which with ſome botaniſts has given riſe to the conjecture that this Fucus may poſſibly be dioicous, while others have carried the matter ſo far as to wiſh to conſtitute two diſtinct ſpecies. The latter idea however is done away by plants being occaſionally found in which both kinds of fructification, as they are called, may be diſcovered upon the ſame plant; and the former ſuppoſition has always appeared to me equally ill-founded, from my once having examined a plant in which the capſule was actually burſting, and the ſeeds partly diſcharged. I have no heſitation in owning, that I never could account for theſe ſeeds, ſuppoſing them to be caſually ſcattered, adhering in ſuch regular lines as is always the caſe; nor can I ſee any reaſon for that part of the membrane upon which they are diſpoſed being of a darker colour, and apparently thicker ſubſtance, than the reſt of the leaf: theſe are difficulties which I hope other botaniſts will remove, but which do not appear to me of ſufficient importance to induce me to accede to the idea of Fuci being monoicous or dioicous. I am indeed on the contrary perſuaded that they prove nothing, as many other Fuci, among which are to be enumerated the following, have their ſeeds equally contained in capſules, and afterwards diſperſed upon the frond, though without the ſame appearance of regularity: theſe are *Fucus alatus*, *ovalis*, *daſyphyllus*, *articulatus*, *kaliformis*, *clavelloſus*, *tenuiſſimus*, and *pinnatifidus*. From a conſideration of theſe and other circumſtances, I have been led to conjecture, that in the above-mentioned

Fuci the capsules, when mature, burst, and immediately die away; while the seeds, from that viscidity which they are known so eminently to possess, adhere to the surface of the frond, till, upon the whole plant at the end of autumn passing into decay, they attach themselves to the stems of the larger species, or rocks, as the force of the sea carries them, and there remain fixed till the latter months of the following spring again awake their vegetative powers.

Excepting *Fucus Hypoglossum* there is none in the British list with which *Fucus ruscifolius* can possibly be confounded, and I shall therefore trouble the Society with no more upon the subject.

FUCUS *crenulatus.*

F. fronde planâ coriaceâ lineari dichotomâ; ramorum apicibus bifurcis oblongo-lanceolatis.

TAB. VIII.

Fig. 3. Planta naturali magnitudine.
4. Frondis apex lente auctus.

Habitat prope Durium flumen in Lusitaniæ littoribus; β apud Dubrem. D. L. W. Dillwyn.

Perennis? Floret Augusto, Septembri.

Radix callus expansus, fibrarum aliquot crassiuscularum rudimentis plerumque instructus. Frondes plurimæ, vix palmares, planæ, enerves, stipiti brevi, tereti insidentes, latè expansæ, undique dichotomæ, lineares, singulari modo, præsertim extremitates versùs, obtusè, sed et minutissimè crenatæ. Apices bifidi, angulis acutis, in lobos oblongo-lanceolatos desinentes. Rami plurimi, nunquam proliferi. Fructificatio tubercula hemisphærica, magnitudine seminis

minis rapæ, verrucofa, pallidè rubentia, feminibus repleta, utrique frondis paginæ infidentia. Subftantia coriacea. Color e fufco faturatè fanguineus, fugaciffimus, et in fordido-flavefcentem tranfiens.

Var. β. fubftantiâ tenuiore, margine integro, apicibus plerumque obtufiffimis.

In felecting for defcription this Portuguefe Fucus, in preference to many more beautiful as well as more rare fpecies, which my friends have been fo obliging as to procure for me from foreign fhores, I am actuated principally by the hope that it may thereby be in my power to throw fome light upon the botany of my own country; what I confider a variety of this having been found abundantly at Dover by my friend Mr. L. W. Dillwyn, and by him obligingly communicated to me in the courfe of the laft autumn. When this plant becomes more generally known and underftood, it may probably admit of well-founded difcuffion how far what I have now made a variety may not in reality be a diftinct fpecies; and I have little doubt but almoft every botanift, who has only an opportunity of examining them in a dry ftate, will immediately decide in favour of the latter opinion. For my own part, I can only fay that I have had many fpecimens of each under my obfervation, and that, after having frequently examined and compared them as attentively as was in my power, I could find no permanent difference between them; though the Englifh plant is ftrikingly diffimilar at firft fight, in having the edges of the frond far more entire, the ends generally blunt and frequently emarginate, but neither of thefe are conftant, and the angles of the forks much lefs acute. The final determination of this point muft be referved for future inveftigation: it is fufficient for my purpofe here to fhow how this fpecies differs from its congeners. *Fucus crenulatus* was brought me in fuch quantity

S 2 from

from Oporto by a gentleman who gathered it there in the month of September 1798, that I can have very little doubt of its being one of the moſt common weeds of that ſhore. It is altogether a connecting link between two ſpecies, by no means nearly allied to each other, *Fucus criſpus* and *Fucus rubens*, with each of which it has many points in common, though ſufficiently removed from the one as well as the other. It agrees in texture and ſubſtance with the former, and in general habit with the latter, but may at firſt ſight be with eaſe diſtinguiſhed from both by the branches always preſerving their linear form, and being divided at the extremities in a manner ſomewhat ſimilar to thoſe of *Fucus bifidus*. The colour too, as far as I have obſerved, differs from that of every other Britiſh Fucus; of a dark red, inclining to brown, moſt rapidly changing, if expoſed to the air or kept in freſh water, to a dull dirty yellow: my Dover ſpecimens, when placed in a ſtrong light, are of a fine pink at the end of the frond. But the moſt ſtriking peculiarities of this ſpecies are the minutely crenulated edges, which cannot fail of being remarked by the moſt inattentive obſerver, and the fructification, which conſiſts of pale fleſh-coloured tubercles of the ſize of a pin's head, plentifully ſcattered upon each ſide of the frond, eſpecially towards the extremities, in their earlieſt ſtage immerſed, but ſoon burſting through the epidermis, and not continuing covered with it, as in all other ſpecies with which I am acquainted except *Fucus radiatus*, ſeſſile, of a ſubſtance inclining to ſpongy, and very different from the reſt of this plant: when dry they turn to a dark brown, and entirely loſe their natural appearance. The habit of this Fucus in a freſh ſtate appears to me to be much twiſted, and in ſome branches almoſt ſpiral. From analogy I have no heſitation in concluding that it is perennial, and Mr. Dillwyn's ſpecimens as well as thoſe brought me from Oporto leave no doubt as to its fructifying in the autumnal months.

FUCUS

Fucus clavellosus

FUCUS *clavellofus.*

F. fronde filiformi fubgelatinosâ ramofiffimâ; ramis confertis; ramulis fubulatis fubpinnatis, tuberculis axillaribus.

TAB. X.

Fig. 1. Planta naturali magnitudine.
2. Ramulus cum capfulâ lentè auctus.
3. Ramulus alter feminibus difperfis.

Habitat apud Brancafter in Norfolciâ; inter rejectamenta maris apud Yarmouth frequens.

Annuus. Floret Julio, Augufto.

Radix callus minutus. Frondes plurimæ, ferè fpithamææ, filiformes, teretes, lubricæ, undique ramofiffimæ, ramis ramulifque approximatis, longitudine variis, fummis ferè pinnatis, fubulato-clavatis, plerumque oppofitis, nunquam vel verticillatis vel ita contractis ut articulati videantur. Frondis craffities pennam pafferinam rarò æquat. Fructificatio, tubercula minuta, nigricantia, e cordato-triangularia, inter ramulos minimos fita, feminibus referta, quæ, capfulis marcefcentibus, ramulis inordinatim adhærent, ulvæque fpeciem pro fe ferunt. Color pallidè ruber.

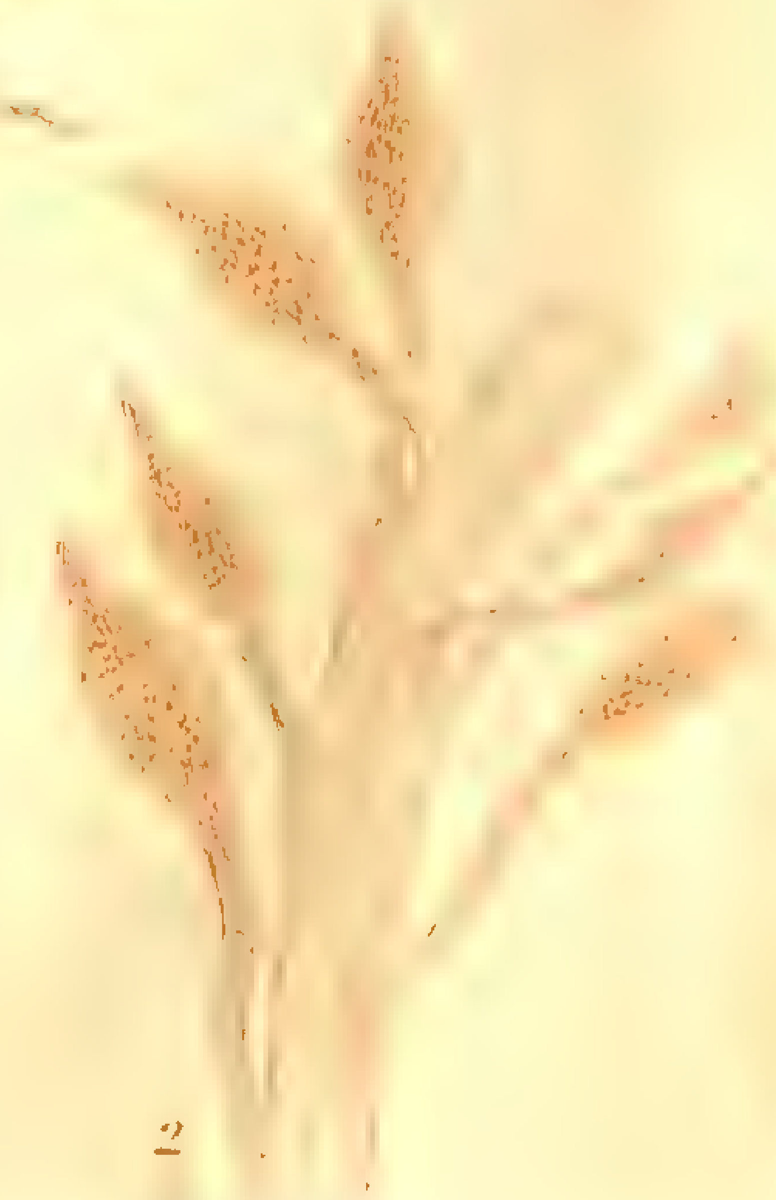
For the information that the late Rev. John Lightfoot had intended to defcribe the prefent plant as a diftinct fpecies, and had beftowed upon it the trivial name of *clavellofus*, I am indebted to the kindnefs of Sir Thomas Frankland; and, as this gentleman has abundantly found it upon the rocks at Scarbro', and long been in the habit of obferving it, I muft be allowed for the fake of fcience to exprefs the wifh I have always felt that he would himfelf have un-

 dertaken

dertaken the defcription and determination of it. The fate of this elegant Fucus has been peculiarly unfortunate, and the endeavouring to point out its fpecific character is attended with fingular difficulties; all authors upon the fubject, with the exception of Mr. Lightfoot, to whom I prefume it was not known when he wrote his Flora, having confidered it only as a varying appearance of *F. kaliformis*, and purpofely drawn up their defcription of that plant fo as to include this fpecies: a circumftance far from furprifing, as they are gathered upon different fhores, fo that few botanifts well acquainted with the one are likely to have feen the other in its place of growth: the *Fucus kaliformis* being principally, if not entirely, confined to the weftern fhores of Great Britain, where I have no reafon to believe that *F. clavellofus*, a native of the coaft from Norfolk to Northumberland, ever makes its appearance. As, during the months of fummer, this latter is far from uncommon upon the Yarmouth beach, I have had an opportunity of watching it for feveral years, in the courfe of which I never, at any period of its growth, remarked a tendency to affume the appearance of the former; but being acquainted with that fpecies only from having feen a few dried fpecimens, I referved my opinion till my tour into Cornwall in the fummer of 1799 gave me an opportunity of examining it plentifully in a recent ftate, and fatisfying myfelf that the plants are even more diftinct when frefh than when expanded upon paper, and preferved in herbaria. The points of difference are of a nature to be far more eafily underftood by a comparifon of fpecimens, than by any language it will be in my power to employ; the moft ftriking of them depending upon the general habit, upon the greater fize of *F. kaliformis*, and upon its branches, particularly the extreme ones, being verticillated, and at intervals fo contracted as to give the whole plant a jointed appearance, very nearly refembling *F. articulatus*, from which in fome battered fpecimens I

 have

1



2

Fucus Wigghii

have had a difficulty in diſtinguiſhing it. Theſe marks, which are very obvious, will be altogether ſufficient to enable any botaniſt to determine between the plants; but I extremely regret that, when I had an opportunity of examining *F. kaliformis* freſh, I omitted ſubjecting the capſules to a ſtrong microſcope, and ſeeing if the ſeeds, which to the naked eye and in a dry ſtate appear round, be not in reality, as in *F. clavelloſus*, rather cordate. If they be not, and I wiſh thoſe naturaliſts who have it in their power would attend to this circumſtance, a ſufficient and perhaps more ſatisfactory difference is at once eſtabliſhed.

FUCUS *Wigghii.*

F. fronde filiformi ſubgelatinoſâ ramoſiſſimâ; ramis ramuliſque ſetaceis; ſetis in ſiliculas lanceolatas mucronatas extenſis.

TAB. X.

Fig. 1. Frons naturali magnitudine.
2. Ramuli particula lentè aucta.

Inter rejectamenta maris apud Yarmouth rariſſimè lecta.

Radix, ut in pleriſque huic proximis, callus minutus. Frons filiformis, teres craſſitie fili emporetici minoris, vix ſpithamæa, ramoſiſſima; rami ſæpiùs alterni, ramulis ita cincti ut pinnati quodammodo appareant: omnes, tàm maximi quàm minimi, ſetis, ut ita dicam, cincti; quæ plerumque ſimplices, interdum autem ſunt bifurcæ, interdumque, ſed rariſſimè, ita diviſæ ut in ramulos novos tranſire videantur. Setæ hæ pedunculorum vice funguntur, ſiliculaſque parvas, ovato-lanceolatas, ſeminibus repletas, in mucronem deſinentes, ad extremitates ferunt. Semina ſaturatè rubra, minima, oculo niſi valdè armato, non diſcernenda. Pedunculi

ſiliculis

siliculis duplò vel triplò longiores. Substantia e cartilagineo gelatinosa, lubrica. Color totius plantæ fusco-ruber.

A single specimen of this Fucus was found many years ago upon the Yarmouth beach by Mr. Wigg, to whose merit I feel a peculiar pleasure in paying what I consider the most public testimony in my power, by making it known to the botanical world under his name; and, as I think there cannot be the smallest doubt of its being totally distinct, not only from every English, but also from every other Fucus hitherto known, I trust that, however uncouth the appellation I have bestowed upon it, the Linnean Society will share my feelings, and nevertheless suffer it under that title to descend to posterity. Mr. Mason and myself have since gathered it, though neither of us more than one plant, nor do I know that it was ever seen in any other part of the kingdom. The place which naturally belongs to it in the British list is immediately between *F. pedunculatus* and *F. asparagoides*; but, as there is no fear of its being confounded with those or any other species, and as I have in my specific character included all the particulars respecting it with which I am acquainted, I shall add no more upon the subject, except that the pods containing the seeds seem to be, as in *F. sinuosus*, *laciniatus*, and many others, merely extensions of the frond, which, when their office is fulfilled, start forth into new branches.

X. *Description of Callicocca Ipecacuanha.*

By Felix Avellar Brotero, Professor of Botany in the University of Coimbra, F.M. L.S.

Read February 3, 1801.

CALLICOCCA Ipecacuanha.

CALLICOCCA caule ascendente, suffruticoso, sarmentoso; foliis ovato-lanceolatis, infernè subpubescentibus; capitulo terminali, pedunculato; involucro tetraphyllo, foliolis subcordatis; corollis quinquefidis.

Tapogomeæ specierum congener. *D. De la Marck. Illustr. Gen. Dict. Bot.*

Ipecacuanha fusca. *Pis. Bras. p.* 101. *It. Margr. Bras. p.* 17.

Brasiliensibus aliis *Ipecacuanha*; aliis *Poaia do Matto*, in australioribus Brasiliæ locis; *Cipó* aliis, uti etiam Portugallensibus.

Pharm. Ipecacuanhæ fuscæ s. brunæ Radix, aut Radix Brasiliensis s. antidysenterica.

Radix perennis, simplex aut subramosa, subteres, sæpius perpendicularis, raro leviter obliqua; duas, tres, quatuorve uncias et ultra longa; supernè gracilior, crassitudine et similitudine caulis, sæpius hic illicve brevibus radiculis instructa (quarum una alterave interdum crassescit); infernè duas tresve lineas crassa, vagè flexa, extùs fusca, subannulata, annulis prominentibus, inæqualibus, subrugosis; sapore acri, amaro, odore vix ullo, nisi herbaceo. Dum

 sicca,

ſicca, cortex craſſa, dura, fragilis, extùs bruna, intùs albicans, gomoſo-reſinoſa, filo percurſa lignoſo, æquali, albo, ferè inſipido, mucilagineo, a quo facilè in plures annulos fiſſa contiguos et inæquales, fiſſuris lævibus, ſeparatur; ſapore primùm farinaceo, poſteà ſubamaro, ſubacri, et ſemper minùs acri quàm in ſtatu viridi, ſeu vivo; odore vix ullo, ſed cum mortario contunditur, tenuis ejus pulvis ſubnaſeoſo nares odore afficit et uſque ad ſternutamentum ſtimulat.

Caulis ſuffruticoſus, ex procumbenti erectus, ad baſin, qua procumbit, interdum repens, teres, craſſitudine pennæ gallinaceæ, quinque ad novem uncias altus, infernè glaber, efoliatus, fuſcus, nodoſus (ubi a foliorum caſu cicatrices), internodiis ſursùm verſus apicem indies decreſcentibus, ibique villoſus, viridis, foliatus, in primis plantæ annis ſimpliciſſimus aut ſimplex, poſteà ſarmentoſus, ſarmentis perpaucis efoliatis, ſubtortuoſis, procumbentibus, plùs minùſve dodrantalibus, nodoſis, ad nodos vagè radicantibus, ibique unum alterumve novum caulem, a primo aut alio ſemipedem et ultra diſſitum, producentibus.

Folia inferiora caduca, ita ut in plantæ floreſcentia 4, 6, aut 8 ſolùm, rariſſimè plura, ad apicem caulis perſiſtant; oppoſita, patentia, ovato-lanceolata, nonnulla interdum ferè obovata, tres ad quatuor uncias longa, unam ad duas ferè lata, integerrima; ſupernè ſaturatè viridia, punctis ſcabriuſculis aſperſa, glabra, raró vagè ſubpubeſcentia; ſubtùs ex viridi-albida, ſubpubeſcentia, coſtâ parùm elevatâ, venis lateralibus alternis, ſubparallelis, ad apicem curvatis: petiolus folii laminâ brevior, 2, 3-ve lineas longus, canaliculatus, ſubvilloſus.

Stipulæ geminæ, laterifoliæ, appreſſæ, ſeſſiles, ſublineares, partito-fimbriatæ, lacinulis ſubulatis, petiolis leviter adnatæ, illorum longitudine aut vix longiores, cum ipſis caulem ſubvaginantes, marceſcentes.

Flores

Flores aggregati in capitulum folitarium, fubnutans, caulem terminans, pedunculatum; pedunculo tereti, pubefcenti, petiolis longiore, plùs minùfve femiunciam alto: flofculi feffiles, 15 ad 24, bracteolis diftincti; bracteolæ involucri et flofculorum longitudine, pubefcentes, integerrimæ, feffiles, virides, formâ fæpe variantes, nunc fubovatæ oblongiufculæ, nunc lanceolatæ obtufiufculæ, nunc (quod rarius) formâ et magnitudine involucri foliolis fimiles, et tunc flofculi ipfis numerofiores.

Involucrum tetraphyllum; folioli fubcordati, acuti, integerrimi, fubfeffiles, leviter undati, hirfuti; duo externi majores, omnes flofculis paulò longiores.

Cal. Perianthium membranaceum, albidum, breviffimum, quinquedentatum, dentibus obtufis, fuperum, perfiftens.

Cor. monopetala: tubus cylindraceus, longus, fuprà parùm ampliatus, fauce et extùs lanuginofus; limbus tubo brevior, quinquefidus, laciniis ovatis, acutis, recurvis.

Stam. Filamenta quinque, capillaria, brevia, fupernè tubo inferta. Antheræ oblongæ, lineares, erectæ, exfertæ.

Pift. ovatum, inferum, non angulatum. Stylus filiformis, longitudine tubi corollæ; margine nectarifero brevi ad bafin cinctus. Stigmata duo, oblonga, craffiufcula, obtufa, antherarum longitudine.

Peric. Bacca unilocularis, difperma, ex ovali-fubrotunda, nec fulcata, nec angulofa, fed lævis, calyce coronata, ex rubro-purpurafcens, mollis, demùm corrugata, nigricans. Quæ immaturæ decidunt, ficcanturque, funt ovales, utrinque (quà femina internè planâ facie continguntur) unifulcatæ.

Semina duo, elliptica, lævia, leviter torta, arillo nullo; hinc plana, lineâ parùm elevatâ mediâ longitudinali notata, inde convexa, ad

 apicem

apicem unisulcata. Testa lignea, sordidè albida; integumentum internum membranaceum, tenuissimum, testæ arctè adnatum: albumen testæ cavitati respondens, convexo-planum, cartilagineum, durum, ex fusco-fulvum, hinc ad faciem planam sulco longitudinali exaratum, inde læve; embryo dicotyledoneus, albumine brevior, erectus, dorsalis.

Habitat in solo umbroso humosoque sylvarum, in Pernambuquiâ, Bahiâ, Riojanæriâ, Paulensiâ, Marianniâ, aliisque Brasiliæ provinciis.

Floret Nov. Dec. Jan.; nec non Februario aut Martio; baccæ Maio maturescunt.

Radicis vires medicæ sat cognitæ.

Hæc omnia non plùs ex meis observationibus in plantis siccis mihi missis, quàm ex aliis in plantis vivis in Brasiliâ iterùm atque iterùm factis a D. Bernard. Bnt. Gomes, Botanicæ Medicæ diligentissimo, et mecum benignè communicatis, teneo.

EXPLICATIO TAB. XI.

Fig. A, B. Caules duo ex sarmento orti.
C. Sarmentum unum.
D, E. Duæ radices.
1. Una stipula cum duobus petiolis; in uno folii basis adest.
2, 3. Duo foliola involucri, unum ex majoribus, aliud ex minoribus.
4, 5. Bracteolæ interflorales.
6. Corolla magnitudine naturali, germini imposita.
7. Eadem lente aucta, uti et calyx et germen inferum.
8. Eadem scissa et aperta ut videantur antheræ.
9. Germen, calyx, stylus et stigmata, lente aucta.

J. Quinn pinx.t 1800

Callicocca Ipecacuanha.

Fig. 10. Bacca magnitudine naturali.

11. Eadem tranſversè ſecta, ut loculus et ſemina duo videantur.

12. Bacca immatura utrinque uniſulcata.

13, 14. Semina leviter torta, magnitudine naturali, ſed hìc plus torta quàm in naturali ſtatu, pictoris negligentiâ.

15, 16. Nucleus ſeminis, avulsâ teſtâ.

XI. *Ob-*

XI. *Obſervations on the Curculio Trifolii, or Clover Weevil, a ſmall Inſect which infeſts the Heads of the cultivated Clover, and deſtroys the Seed. In a Letter to Thomas Marſham, Eſq. Tr. L. S. by William Markwick, Eſq. F.L.S. With additional Remarks by Mr. Marſham.*

Read February 3, 1801.

DEAR SIR,

THE very polite and obliging attention ſo frequently ſhown by you to my trifles in Natural Hiſtory, encourages me to trouble you with this letter, to be laid, if you think proper, before the Linnean Society; and ſhould they diſcover in it any thing that at all tends to improve the ſcience, or that may be in any other reſpect uſeful, I ſhall feel myſelf highly gratified.

Having ordered a field of clover, conſiſting of about eight acres, to be ſaved for ſeed, my ſervant, on the 9th of Auguſt laſt, aſked me whether I choſe to ſave the whole field for that purpoſe, ſaying that he had examined ſeveral of the heads, and found the maggot in them. On this information I was induced to order only a part of the field to be ſaved for ſeed, and the reſt to be mowed for hay. Soon after, I went myſelf to examine the ſtate of the clover, and found in many of the heads ſeveral ſmall white maggots or larvæ, invariably placed on the outſide of the baſe beneath the individual calyx of each floret, eating through the bottom, and thereby deſtroying the germen or rudiment of the future ſeed. Each of theſe larvæ appeared to be exactly ſimilar in ſhape and colour (only much ſmaller) to the nut maggot, having a white body, black head, and,

and, as I at firſt imagined, no legs; but I have ſince diſcovered, on a cloſer inſpection aſſiſted by glaſſes, near the head, three ſmall white ſcales or prominences on each ſide, which I ſuppoſe may ſupply the place of legs, in this minute inſect. See TAB. V. fig. a. A. I traced it through its chryſalis to its imago or perfect ſtate, in the following manner. Having placed a number of the blighted heads of the clover in a box, which was carefully covered with gauze to prevent any inſect from getting either in or out, I found, on opening the box on the 19th of the ſame month, a great number of ſmall blackiſh weevils running about in it, and on inſpection diſcovered many of their chryſalids, ſticking to the ſtem at the baſe of the individual floret, exactly in the ſame ſituation as I had before found the larvæ; nay, I even ſaw one or two of theſe weevils crawl out from their chryſalids.

Under theſe circumſtances there can be no doubt that the before-mentioned larva changes to a ſmall white chryſalis, which differs but little from it, except in being egg-ſhaped and motionleſs; and this produces a ſmall blackiſh weevil with a long beak, whitiſh belly, and yellow legs.

With regard to the quantity of damage done by this little deſtructive inſect, I know of no better way of aſcertaining it, than by taking a comparative view of two of my crops, which grew in two fields adjoining to each other, and which appeared to be equally good with reſpect to the growth of the plants, but very different in the produce of ſeed: this will leave but little doubt that the deficiency of this year's crop has been occaſioned by the devaſtations of theſe inſects, which abounded in an aſtoniſhing degree. This I ſhall do with as much accuracy as I can.

In the year 1798 I grew on nine acres of ground (juſt double the quantity that was ſaved for ſeed this year) either thirty-three or thirty-four buſhels and a half of clover ſeed, of which twenty-eight

 buſhels

bushels and a half were sold for fifty shillings per bushel, and the rest, amounting to either five or six bushels (I am not quite certain which), was kept for my own use; so that, taking it at the lowest, the statement will stand thus:

	Bushels.		£.	s.	d.
In 1798 four acres and a half, being half of the crop, produced	$16\frac{3}{4}$	which sold for	41	17	6
This year (1800) the same quantity of ground produced only - -	$7\frac{1}{2}$	worth at same price	18	15	0
Deficient	$9\frac{1}{4}$	worth	23	2	6

Thus it appears that the loss on this year's crop is very great, occasioned, most probably, by the depredations of this insect; and besides, what seed I have is of an inferior quality.

The species of clover sown in both these fields was the common purple or honey-suckle clover, which I take to be no other than the *Trifolium pratense* of Linné improved by culture.

I am, &c.

REFERENCES TO THE FIGURES.

TAB. V. Fig. a. The larva of the natural size.

A. The same magnified.

b. The chrysalis of the natural size.

B. The same magnified.

c. The weevil of the natural size.

C. The same magnified.

d. The individual calyx with the larva eating through its bottom, magnified.

The

The foregoing obſervations of Mr. Markwick furniſh another inſtance of the deſtructive property of inſects to the agriculture of this country, prove the neceſſity, particularly at this time, of a minute inveſtigation into the cauſes of the failure of crops, and fully evinces that the practical entomologiſt is a valuable member of ſociety; as, by diſcovering the œconomy and perfect hiſtory of theſe minute deſtroyers, and aſcertaining, as much as poſſible, the injury they do, we may either be enabled to diſcover a remedy to the evil, or to diſſipate our fears when we perceive, as in the caſe of the wheat inſect ſo fully deſcribed by this gentleman and Mr. Kirby, that Providence has ſet bounds to their miſchief, and provided a ſuitable check to prevent its increaſe. The inſect here mentioned has been deſcribed by ſeveral authors, ſome of whom have given a figure of it; but they all appear to have been unacquainted with its hiſtory except the great Linné, for it is without doubt the *Curculio Trifolii* of that celebrated naturaliſt, and deſcribed by him in the *Appendix Animalium*, *Syſt. Nat.* vol. iii. p. 224. where he ſays, " *Habitat* in Trifolii montani *ſpicis, intra quas declaratur.*" It is alſo, I preſume, the *Curculio flavipes* of Fabricius, *Syſtema Entomologiæ*, p. 133, n. 33, and of Paykul's Monograph, n. 135; but they only obſerve, " *Habitat frequens primo vere locis apricis calidioribus.*" Geoffroy calls it *le Becmare noire à pattes fauves*, in his *Hiſtoire Abrégée des Inſectes*, tom. i. p. 272, n. 8. and adds to the deſcription " *On le trouve ſur les fleurs.*" Fabricius in his *Entomologia Syſtematica emendata* has removed it from the genus *Curculio*, and attached it to that of *Attelabus*, in which he has been followed by Panzer in his *Entomologia Germanica*, p. 298, n. 22, and *Fauna Germanica* 20, tab. 13, but I think without reaſon, and they add nothing to its hiſtory. The latter author ſays " *Habitat in ſalice, populo, primo vere;*" but taking the *Habitat* merely from the plants on which inſects are found, without further examination, muſt frequently lead to error. I had examined this inſect in its per-

 fect

fect ftate very minutely, and have defcribed it in my manufcript as follows:

CURCULIO *Trifolii.* Cur. ater, roftro porrecto, pedibus ferrugineis: plantis nigris.
Long. corp. 1½ lin.
Habitat in Trifolio.

DESCRIP. Corpus atrum. Roftrum thorace paulo longius. Antennæ piceæ. Thorax punctulatus. Elytra ftriata. Pedes ferruginei, plantis femper nigris; eft ubi tibiis nigris variat. Abdomen niveum.

T. M.

XII. *Further*

XII. *Further Obſervations on the Curculio Trifolii. In a Letter to William Markwick, Eſq. F.L.S. by Martin Chriſtian Gottlieb Lehmann, M.A. of Gottingen.*

Read February 3, 1801.

SIR,

WHEN you favoured me, laſt ſummer, with an account of the damage done to your clover by a number of little maggots, and permitted me to gather ſome of the injured flower-heads, I felt intereſted in the cauſe, and became anxious to obſerve the œconomy and changes of this little deſtructive animal, and by my obſervations, in addition to thoſe which you had ſent to the Linnean Society, to endeavour to complete the hiſtory of an enemy you had ſo unfortunately become acquainted with.

As far as my limited knowledge in the ſcience of entomology extends, nothing appears to have been hitherto publiſhed of the nature and habits of this inſect. The French naturaliſt Geoffroy, who firſt deſcribed the perfect animal, ſays it is found on flowers, and calls it *le Becmare noir à pattes fauves*, but takes no notice of its larva. Fabricius deſcribes it as an *Attelabus*, and obſerves " Habitat *primo vere frequens locis apricis calidioribus* ;" which perfectly agrees with my own obſervation, for it was the firſt inſect I found laſt ſpring in a ſunny meadow near a ſhrubbery.

The blighted clover heads which I gathered in your grounds in Auguſt were, like all the reſt in the field, full of maggots of different

 ſizes,

ſizes, which of courſe paſſed into their perfect ſtate at different periods from the middle of Auguſt until the end of September.

I preſerved half a dozen of them in a flower-pot covered with gauze, in which I had previouſly ſown ſome turnip ſeed. They fed a little upon the cotyledons of this plant, but ſeemed not inclined to perform that duty which nature has impoſed on them in their perfect ſtate. On the contrary, they ſoon retired to a ſecret corner of their priſon *above* the earth, where they remained in a quieſcent ſtate; and, after the firſt cold nights in October, appeared as if dead, but ſoon revived upon being brought into my warm ſtudy.

Few as theſe obſervations may appear, yet, added to your intereſting diſcovery, they may form an outline of the hiſtory of this little animal, which further and more accurate obſervations may complete.

Hatched between the calyces of the *Trifolium pratenſe*, the maggot penetrates with its head into the rudiments of the firſt ſeed, as yet in a liquid ſtate, and then proceeds to another more advanced and ſuitable to its increaſed ſtrength. Having conſumed 3 or 4 of them, it remains in the place of the laſt, where it is ſufficiently ſheltered, and changes like other weevils into the pupa or chryſalis ſtate, through the tranſparent ſkin of which an experienced eye may trace the different limbs of the future animal. After a few days the inſect comes forth in its imago or perfect ſtate, at firſt ſoft and white, but ſoon changing to a ſhining black colour, except the tibiæ and firſt joint of the antennæ, which remain yellow.

Having taken a ſhort meal, it ſlowly conceals itſelf in the ſmall holes of fences, or in the bark of trees, where it repoſes during the winter, if ſufficiently protected from its numerous enemies. Few however, happily, ſurvive; for it appears impoſſible that many ſhould eſcape the vigilance and dexterity of the wren, the redbreaſt, the

nun,

nun, and other birds of the titmouſe kind *(Motacillæ, Pari.)*. Such as eſcape their bills are among the firſt partakers of the univerſal life which nature excites in the ſpring. Laſt year they appeared in Suſſex in the month of March, and, in addition to their numerous perſecutors, the *Staphylini* were then particularly formidable to them.

Surrounded by ſo many dangers, while feeding on the tender leaves of plants, they are employed in ſeeking their conſorts, until the heads of clover and perhaps other papilionaceous flowers break out, when the female depoſits on the cup of the ſwelling ſeed the egg that produces its deſtroyer.

The fecundity of this little inſect is ſo prodigious, that the maggots deſtroyed a whole field which the year before, when not a ſingle inſect of this kind was diſcovered, produced 70 pounds of ſeed. There is reaſon to believe, however, that the parents of thoſe millions were then in your grounds, as, the animal being not only deſtitute of wings but alſo very ſlow in its motion, it is not probable that it could have overrun your field to ſuch a degree from a diſtance in the courſe of one ſeaſon.

In the hiſtory of this, as in almoſt that of every other inſect, if obſerved with attention, the œconomy of nature appears wonderful. This little inſect ſeems deſigned to prevent the boundleſs increaſe of the trefoil, and is itſelf circumſcribed in its numbers by numerous enemies conſtantly on the watch to devour it. The female of this inſect could never lay a great number of eggs if ſhe had to ſearch for flowers ſparingly ſpread over a large field, as ſhe would in that caſe infallibly become a prey to ſome of her enemies; whereas in the clover field, where flower preſſes upon flower, ſhe may lay ten thouſand in ſecret.

The wolf is extirpated in theſe iſlands, formerly its abode. Inſects not leſs formidable and deſtructive are yet unſubdued. Our cattle, our fields

fields, our granaries, &c. often bear witnefs to this truth. The fame fpirit which made us mafters of the creation is ftill neceffary to preferve the government. Our knowledge muft keep pace with our defires, and men in general will foon be compelled by neceffity to the univerfal purfuit of a fcience to which a philofophic mind needs no fuch incentive.

November 28, 1800.

XIII. *De-*

a
a
b
b
b
c
c
d
d
d
e
e
f
g
1
1
2
2
2
2
3
3
3
3
3

XIII. *Description of Brotera persica and Mustelia eupatoria, two new Plants cultivated in the Botanic Garden of Halle, by Curt Sprengel, M.D. Professor of Botany in the University of Halle.*

Read March 3, 1801.

BROTERA PERSICA.

TAB. XII.

CLASSI XIV. adnumeranda.

Character essentialis genericus.

LABII inferioris lacinia media cucullata, involvens genitalia, eaque cum impetu protrudens.

DESCRIPTIO.—*Herba* quadripedalis, caule ramisque tetragonis, axillis (fig. *a.*) barbatis.

Folia opposita, subsecunda, petiolata, ovata, serrata, scabriuscula.

Infloresc. Cymata axillaris pedunculata. (fig. *b. b.*)

Cal. quinquearistatus, pubescens. (fig. *c. c.*)

Corolla minuta, calyce vix longior, ringens (fig. *d.*): labium superius bipartitum: (1.) inferius tripartitum, lacinia media (3.) cucullata, antheras cum stylo occultans, donec externus stimulus accedat, qui ilico deprimit cucullum, ut antheræ erectæ prodeant

prodeant. Corolla pallida, lutefcit ad faucem cuculli: ipfe cucullus rufus eft.

Stamina pilofa. *Antheræ* luteæ. (fig. *e.*)

Stylus violaceus. *Stigma* capitatum. (fig. *f.*)

Semina quatuor oblonga nuda in fundo calycis. (fig. *g.*)

In honorem fummi botanici Felicis Avellar Brotero, Prof. Conimbricenfis, id genus dixi. Accepi autem femina ab amico *Thouino* e mufeo naturali Parifino, quo apportata funt ab *Oliverio* et *Bruguerio* e Perfia.

MUSTELIA EUPATORIA.

TAB. XIII.

CLASSI XIX. adnumeranda.

Character effentialis genericus.

Anthodium fimplex polyphyllum. *Rec.* nudum. *Papp.* duplex, paleaceus & quinquearistatus. *Corollulæ* quinquefidæ.

DESCRIPTIO.—*Herba* bipedalis: caule inclinato, recurvato.

Folia oppofita, fafciculata, oblonga, apice denticulata, lucida, punctata, trinervia.

Inflor. in corymbis, quorum medius primo floret, lateralibus elongatis ferius florefcentibus.

Anthodium conftanter quinqueflorum, polyphyllum, æquale. (fig. *a.*)

e
e
d
a
a
b
c
c

Corollulæ quinquefidæ, quinæ. (fig. *b.*)

Stigmata longissima. (fig. *e. e.*)

Pappus duplex, paleaceus alter externus, internus alter quinque-aristatus. (fig. *e.*)

His potissimum notis abunde distinguitur ab Agerato et Eupatorio, cum quibus alioquin germanitatem quamdam naturalem habet.

Dixi in honorem eximii phytologi, *Mustelii*, cujus *Essai sur la Végétation* insignia addidit incrementa doctrinæ de fabrica plantarum & de usu partium.

XIV. *Obfervations on the Hinges of Britifh Bivalve Shells.*

By Mr. William Wood, F.L.S.

Read January 6, 1801.

AMONG the many authors who have either noticed fhells in their works on Natural Hiftory, or have written profeffedly on the fubject, it is rather extraordinary that no particular attention fhould have been hitherto paid to their hinges; more efpecially as they afford the leading characters by which fhells are arranged.

Da Cofta, indeed, in his *Elements of Conchology*, has figured the hinges of the feveral genera of bivalves; but many of them are not calculated to give a clear idea of the parts which they are intended to reprefent: befides, he has confined himfelf to one fpecies in a genus, which is by no means fufficient, inafmuch as many of the hinges of the fame genus of fhells differ materially from one another in their fpecific characters.

Figures on this fubject have been given alfo in the laft volume of the *Amœnitates Academicæ*; but thefe are more calculated to miflead than to inftruct. The confideration that fomething of this kind, executed in a more accurate and comprehenfive manner than has hitherto been done, is ftill a defideratum among conchologifts, has induced me to attempt the following obfervations, which I lay before the Society with all diffidence, confcious that they are far from being faultlefs, and that fome fhells are omitted which may,

 for

for any thing I know to the contrary, exhibit peculiarities in the formation of their hinges, not to be found in this paper. Perhaps what is already finiſhed may excite ſome more able member of this Society, whoſe cabinet is more extenſive, to complete the ſubject.

I am indebted to the accurate pencil of my friend Mr. Henry Boys for the *Solen pellucidus*, *Tellina bimaculata*, *Venus Chione*, and *Venus undata*. My acknowledgments muſt likewiſe be made to his moſt reſpectable father, William Boys, Eſq. for the ready acceſs which I have at all times had to his collection.

In the courſe of the following remarks, it will be noticed, that ſeveral ſhells are totally neglected, which are too common to be wanting even in a very confined collection. To account for this, it will be neceſſary to mention all the ſhells belonging to the British ſeries of bivalves which have not been inſerted, and to give a ſufficient reaſon for their omiſſion.

Of the genus *Mya*, all have been figured, except the *M. dubia* of Mr. Pennant, which at preſent I have not in my collection.

Of the *Solenes*, I have neither the *Legumen* nor *Cultellus*. But their loſs is of little conſequence, as the teeth of the former (according to Mr. Pennant) exactly reſemble thoſe of the *S. pellucidus*; whilſt the latter, having a ſingle tooth on both ſides of the hinge, will probably not differ materially from the *Vagina*. The hinge of the *S. Enſis* agrees exactly with that of the *Siliqua*.

Among the *Tellinæ*, the *T. fragilis* is unknown to me. The *T. trifaſciata*, *cornubienſis*, and *donacina*, are wanting, and the hinge of the *Fabula* is like the *planata*.

There is too great a ſimilarity in the hinges of the ſpecies belonging to the genus *Cardium*, to make more than one figure neceſſary.

Excepting the two lateral teeth of the *Mactra ſolida*, no eſſential

 difference

difference is to be perceived between the hinge of that ſhell and of the *M. lutraria*. I have therefore omitted it, in order that the number of figures might not be unneceſſarily increaſed.

Of the two ſpecies of *Donax*, deſcribed by Britiſh conchologiſts, the *Trunculus* only is in my poſſeſſion; but it is more than probable, from the reſemblance theſe two ſhells bear to each other, that their hinges are not very diſſimilar.

I have never ſeen the *Venus deflorata*, deſcribed and figured by Mr. Pennant in the *Britiſh Zoology*. The *V. ſinuoſa* and *ovata* are not among my ſhells; and the hinge of the *V. rotundata* is too like the *decuſſata* to need a deſcription. The hinge of the *V. borealis* will be found, upon compariſon, to reſemble exactly that of the *Mactra alba*; therefore it would be placed with more propriety in that genus. The *Donax Irus* ought at the ſame time to be removed into the third diviſion of the genus *Venus*, where the contour of the ſhell, as well as the formation of the hinge, will point out its proper ſituation.

In the genus *Arca*, it was thought unneceſſary to give a figure of the *lactea*, after exhibiting the ſtriking difference between the hinge of the *A. Nucleus* and *Glycymeris*.

Of the genus *Pecten*, *Oſtrea*, *Anomia*, and *Mytilus*, it is ſufficient to ſay, that a ſpecimen has been given from each, as the ſpecies are, for the moſt part, deſtitute of teeth, and the ſhells merely united by cartilage.

MYA.

truncata. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3217. *Penn. Br. Zool.* *No.* 14. *t.* 41 *f.* 14. *Da Coſt. Br. Conch. p.* 233 *t.* 16. *f.* 1. 1.—*Elem. Conch. t.* 7. *f.* 16. *Liſt. Conch. t.* 428. *f.* 269.—*Hiſt. An. Ang. t.* 5. *f.* 36. *Gault. Teſt. t.* 91. *f.* D. *Chemn. Conch.* 6. *t.* 1. *f.* 1, 2.

TAB.

TAB. XIV. Fig. 1, 2.

A thick, broad, upright, ſtriated tooth in the upper valve*; in the lower valve, a deep, ſpoon-ſhaped hollow, with a ſmall tooth on one ſide, and a ſharp ridge on the other, running from the beak towards the truncated end.

Liſter, in his *Hiſtoria Animalium Angliæ*, has figured the lower valve of this ſhell, but has totally miſtaken the form of the tooth.

Da Coſta, in his *Britiſh Conchology*, and likewiſe in his *Elements*, has ſucceeded better, although his figures are by no means perfect.

arenaria. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3218. *Penn. Br. Zool. No.* 16. *t.* 42. *f.* 16. *Liſt. Conch. t.* 418. *f.* 262.—*Baſt. Opuſc. ſubſ.* 2. *p.* 69. *t.* 7. *f.* 2, 3. *Argenv. Zoom. t.* 5. *f.* 10.

TAB. XIV. Fig. 3, 4.

Hinge with an upright, fanſhaped tooth; on the ſide, a ridge deeply ſulcated; lower valve like the preceding, except the ſide tooth, which is ſcarcely to be diſtinguiſhed.

Mr. Pennant has given a very good figure of the tooth in the upper valve of this ſhell, and of the *M. truncata.*

* For the ſake of perſpicuity, in the deſcription of the Hinge, I have called that the upper valve which contains the great tooth.

margaritifera.

margaritifera. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3219. *Penn. Br. Zool.* *No.* 18. *t.* 43. *f.* 18. *Da Coſt. Conch. t.* 15. *f.* 15. *Liſt. Conch. t.* 149. *f.* 4.—*An Ang. App.* 15. *t.* 1. *f.* 1. *Chemn. Conch.* 6. *t.* 1. *f.* 5. *Gault. Teſt. t.* 102. *f.* C. *Klein. Oſtr. t.* 10. *f.* 47. *Knorr. Vergn.* 4. *t.* 25. *f.* 2.

TAB. XIV. Fig. 5, 6.

The hinge of this ſhell is very thick and rugged; the tooth in the upper valve blunt, and uneven at the top. On one ſide there is a ſulcus, which receives a ſmall tooth from the oppoſite valve, at the ſame time that the large one fits into a correſponding depreſſion.

This, with the following ſhell, completes Da Coſta's genus of *Mya.* The two former he has placed among the *Chamæ.*

pictorum. *Linn. Syſt. Nat. ed. Gmel.* 3218. *Penn. Br. Zool. No.* 17. *t.* 43. *f.* 17. *Da Coſt. Br. Conch. p.* 228. *t.* 15. *f.* 4. 4. —*Elem. Conch. t.* 7. *f.* 12. *Liſt. Conch. t.* 147. *f.* 2, 3. —*An. Ang. t.* 2. *f.* 30. *App. t.* 1. *f.* 4. *Chemn. Conch.* 6. *t.* 1. *f.* 6. *Argenv. Conch. t.* 27. *f.* 10.— *Zoom. t.* 8. *f.* 11.

TAB. XIV. Fig. 7, 8.

In the hinge of the *M. pictorum* we meet with an arrangement of teeth different from any other of the Britiſh ſpecies of this genus.

Near the beak are ſituated two upright teeth, one in each valve. The largeſt of the two is ſerrated.— There are likewiſe three remote teeth, two in one ſhell,

ſhell, and one in the other. Both Da Coſta and Pennant have figured the inſide of this ſhell, without paying any attention to the teeth. Dr. Liſter, however, thought their arrangement too curious to be paſſed unnoticed. He has therefore engraved them in his *Hiſt. Conchyliorum*, and alſo in his *Hiſt. An. Ang.*

SOLEN.

Siliqua. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3223. *Penn. Br. Zool. No.* 20. *t.* 45. *f.* 20. *Da Coſt. Br. Conch. p.* 285. *t.* 17. *f.* 5.—*Elem. Conch. t.* 7. *f.* 8. *Liſt. Conch. t.* 409. *f.* 255.—*An. Ang. t.* 5. *f.* 37. *Chemn. Conch.* 6. *t.* 4. *f.* 29. *Gault. Teſt. t.* 95. *f. C. D. E. Knorr. Vergn.* 6. *t.* 1. *f.* 1.

TAB. XIV. Fig. 9.

The hinge of the *Solen Siliqua* is furniſhed with three teeth; two thick ones in one valve receiving a lamina between them from the other. An edged production from the teeth is continued down about the third of an inch on each ſide of the hinge, where it terminates inwards in a rounded ſhape.

Da Coſta, in his *Br. Conch.* has deſcribed the *Solen Siliqua*, but figured the *S. incurvatus* of Dr. Solander. Gmelin alſo has fallen into much the ſame error, by quoting Liſter, *Hiſt. Conch. t.* 413. A note of interrogation, indeed, is very properly added, but no reference is made to t. 409, f. 255, which is an exact copy of the true figure of the *S. Siliqua*, in the *Hiſt. An. Ang.*

The hinge in the two ſhells is the ſame.

Vagina.

Vagina. *Linn. Syst. Nat. ed. Gmel.* 1. *p.* 3223. *List. Conch. t.* 410. *f.* 256. *Argenv. Conch. t.* 24. *f.* K. L. M. *Zoom. t.* 6. *f.* G. H. *Knorr. Vergn.* 1. *t.* 28. *f.* 3.

TAB. XIV. Fig. 10.

Hinge with a single tooth in each valve. A continuation of the inner edge of the shell forms the upper tooth. The lower one is fixed upon a base, which is situated obliquely.

The surface of both is flat.

pellucidus. *Penn. Br. Zool.* No. 23. *t.* 46. *f.* 23.

TAB. XIV. Fig. 11.

The hinge of this very delicate shell is furnished with five small, pointed teeth, three of which are situated in one valve, and two in the other. It must be remarked, that the central one of the three is bifurcated.

This shell has hitherto, I believe, escaped the notice of every author, except Pennant; who informs us that it inhabits the Red Wharf, Anglesea. We find it, though very rarely, in the muddy part of the Sandwich shore, towards the mouth of the haven. A few specimens have lately been dredged up at Folkstone.

TELLINA.

planata. *Linn. Syst. Nat. ed. Gmel.* 1. *p.* 3232. *Penn. Br. Zool.* No. 29. *t.* 48. *f.* 29. *List. Conch. t.* 405. *f.* 251. *Gault. Test. t.* 77. *f.* M.

TAB.

Tab. XV. Fig. 1—4.

One valve of the *T. planata* contains three teeth; two near the beak, and one rather remote.

The other valve has only two, and the largeſt is divided longitudinally.

incarnata. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3234. *Penn. Br. Zool. No.* 32. *t.* 49. *f.* 32. 32. *Liſt. Conch. t.* 405. *f.* 250. —*An. Ang. t.* 4. *f.* 25. *Da Coſt. Br. Conch. p.* 211. *t.* 12. *f.* 4. 4. 4. *Gault. Teſt. t.* 88. *f. M.*

Tab. XV. Fig. 5—8.

This ſhell has two teeth cloſe to the beak in each valve, one of which is ſulcated. There are no remote teeth.

Mr. Pennant has called this ſhell *carnaria.* I believe his *T. incarnata* to be the *T. radiata* of Linnæus.

cornea. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3242. *Penn. Br. Zool. No.* 36. *t.* 49. *f.* 36. *Da Coſt. Br. Conch. p.* 173. *t.* 13. *fig.* 2. 2. *Liſt. Conch. t.* 159. *f.* 14.—*An. Ang. t.* 2. *f.* 31. *App.* 22. *t.* 1. *f.* 5. *Gault. Teſt. t.* 7. *f. B. C. Chemn. Conch.* 6. *t.* 13. *f.* 133. *a. b.*

Tab. XV. Fig. 9—12.

In the *T. cornea* we find four teeth in each valve. The two remotely ſituated are of a conſiderable ſize; but thoſe placed more immediately under the beak are ſo minute, that they are hardly to be diſtinguiſhed without a magnifying glaſs, even in the large Thames ſpecimens.

If the principal generic character of a ſhell reſt upon the formation of the hinge, it will, perhaps, be difficult to find a proper place for the *T. cornea.* The central teeth do not perfectly agree with the character of a *Tellina*; and the remote teeth differ ſo evidently, that Da Coſta has removed this ſhell into the next genus, where we find it under the name of *Cardium Nux.*

rivalis. *Maton in the Linn. Tranſ. v. 3. p. 44. t. 13. f. 37, 38.*

TAB. XV. Fig. 13—16.

The hinge of this ſhell is formed of four teeth in each valve, two at the beak and two remote. The two near the beak in one valve unite to form a ſmall arch. One of the teeth in the other valve is double.

T. rivalis is ably deſcribed, and well figured, in the Tranſactions of this Society, where the difference between it and the *T. cornea* is ſufficiently pointed out.

bimaculata. *Linn. Syſt. Nat. ed. Gmel. 1. p. 3240. Da Coſt. Br. Conch. p. 213. Chemn. Conch. 6. t. 13. f. 127.*

TAB. XV. Fig. 17, 18, 19.

The figure of this ſhell was ſent to me, unaccompanied by a deſcription. There appears to be a thick tooth in the centre of the hinge of one valve; and a cavity, probably for its reception, between two teeth, in the oppoſite.

fervenſis.

ferventis. *Linn. Syst. Nat. ed. Gmel.* 1. *p.* 3235. *List. Conch. t.* 394. *f.* 241.

TAB. XV. Fig. 20, 21.

This hinge, in one valve, has a single upright tooth, situated by the side of a slight depression, which is divided in the middle by a small ridge. The lower valve has likewise an erect tooth, which is notched.

The shape of this shell approaches so nearly to the *T. radiata*, that I imagine the hinge in both will be found the same. At present I have not an opportunity of comparing them.

CARDIUM.

aculeatum. *Linn. Syst. Nat. ed. Gmel.* 1. *p.* 3247. *Penn. Br. Zool. No.* 37. *t.* 50. *f.* 37. *Da Cost. Elem. of Conch. t.* 1. *f.* 8. *List. Conch. t.* 321. *f.* 128. *Gault. Test. t.* 72. *f. A.* *Chemn. Conch.* 6. *t.* 15. *f.* 155—157.

TAB. XVI. Fig. 1, 2.

The character of the hinge in this shell is so strongly marked, and so exactly resembles the other species, that one figure will suffice for the whole genus.

No other description is necessary than what may be found in the explanation of the plates.

MACTRA.

lutraria. *Linn. Syst. Nat. ed. Gmel.* 1. *p.* 3259. *Penn. Br. Zool. No.* 44. *t.* 52. *f.* 44. *List. Conch. t.* 415. *f.* 259.— *An. Ang. t.* 4. *f.* 19. *Rumph. Mus. t.* 45. *f. M.* *Chemn. Conch.* 6. *t.* 24. *f.* 240, 241.

TAB. XVI. Fig. 3, 4.

The valves of this ſhell are firmly connected together, by a quantity of cartilage ſeated in two ſpoon-ſhaped cavities. On the ſide of one of the cavities, in the upper valve, there is a very ſtrong tooth, the two plates of which form an obtuſe angle, and the whole is received between two teeth in the oppoſite valve.

Da Coſta, when he wrote his *Britiſh Conchology*, was not aware that this ſhell formed a diſtinct ſpecies from the following; he has therefore deſcribed and figured the *M. hians* α under the name of *Chama magna*, while his Synonyms direct the reader to the *M. lutraria*.

hians. *Da Coſt. Br. Conch. p.* 231. *t.* 17. *f.* 4.

TAB. XVI. Fig. 5, 6.

The great cavity in the hinge of this ſpecies is larger, more ſpread, but not ſo regularly ſhaped as in the preceding. The great tooth in the upper valve locks, like that in the *M. lutraria*, between two teeth in the lower valve, of which the outer one, in the ſpecimen before me, is grooved longitudinally, and, when the ſhell is cloſed, fits into a ſmall cavity on the outſide of the tooth in the upper valve. It ſhould likewiſe be noted, that there is in both valves a deep, narrow ſulcus, which runs from the beak of the ſhell acroſs the baſe of the great cavity, and cloſe on the inſide of the teeth.

ſtultorum.

ſtultorum. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3258. *Penn. Br. Zool.* *No.* 30. *t.* 49. *f.* 30. *Da Coſt. Br. Conch. p.* 196. *t.* 12. *f.* 3. 3. *Liſt. Conch. t.* 251. *f.* 85. *Gault. Teſt. t.* 71. *f.* C. *Chemn. Conch.* 6. *t.* 23. *f.* 224—227.

TAB. XVI. Fig. 7, 8.

There is an erect tooth in the upper valve of this ſhell, near the beak, ſomewhat ſimilar in ſhape to the great one in the *M. lutraria.* This fits within a rectangular tooth in the lower valve, which likewiſe contains four remote teeth, like laminæ, receiving between them two from the upper valve.

I have referred for this ſhell to Mr. Pennant's *Tellina radiata*, as both his deſcription and figure agree exactly with the Linnean *M. ſtultorum.* His ſhell of that name (*No.* 42. *t.* 52. *f.* 42.) is, perhaps, only a young one of the *M. ſolida.*

alba. TAB. XVI. Fig. 9—12.

I believe we are indebted for the diſcovery of this ſhell to that accurate conchologiſt, William Boys, Eſq. who found it on the Sandwich ſhore, where I have ſince met with it in abundance.

The hinge has the true ſpoon-ſhaped cavity peculiar to the genus *Mactra*, with a ſmall tooth ſituated cloſe to it in the upper valve, which has no remote teeth. The lower valve is provided with two.

DONAX.

trunculus. *Lynn. Syſt. Nat. ed. Gmel.* 1. *p.* 3263. *Penn. Br. Zool.* *No.* 45. *t.* 55. *f.* 45. *Da Coſt. Br. Conch. p.* 207. *t.* 14.

t. 14. *fig.* 3. *Liſt. Conch. t.* 376. *f.* 217.—*An. Ang. t.* 5. *f.* 35. *Borlaſe Cornw. p.* 278. *t.* 28. *f.* 25. *Chemn. Conch.* 6. *t.* 26. *f.* 253, 254.

TAB. XVI. Fig. 13—16.

Hinge with a thick furrowed tooth in one valve, received between two others in the oppoſite. A ſingle marginal tooth in each valve, at a little diſtance from the beak.

VENUS.

iſlandica. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3271. *Penn. Br. Zool. No.* 47. *t.* 53. *f.* 47. *Da Coſt. Br. Conch. p.* 183. *t.* 14. *f.* 5. *Liſt. Conch. t.* 272. *f.* 108.—*An. Ang. t.* 4. *f.* 22. *Gault. Teſt. t.* 85. *f. B. Chemn. Conch.* 6. *t.* 32. *f.* 341.

TAB. XVII. Fig. 1, 2.

There is a thick upright tooth under the beak in one valve of this ſhell, which locks between two others in the oppoſite valve.

For the other teeth with which this ſhell is provided, ſee the Explanation of the Plates.

Chione. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3272. *Da Coſt. Br. Conch. p.* 184. *t.* 14. *f.* 7. *Gault. t.* 86. *f. A.*

TAB. XVII. Fig. 3, 4.

A ſtrong thick tooth is ſeated in each valve, directly under the cordiform depreſſion of the ſhell; another cloſe to the beak, and a third diverging from it, which laſt is thin, and in one valve grooved.

verrucosa. *Linn. Syst. Nat. ed. Gmel.* 1. *p.* 3269. *Penn. Br. Zool. n.* 48. *t.* 54. *f.* 48. *Da Cost. Conch. p.* 185. *t.* 12. *f.* 1. 1. *List. Conch. t.* 284. *f.* 122. *Gault. Test. t.* 75. *f. H.* *Borlase Cornw. p.* 278. *t.* 28. *f.* 32.

TAB. XVII. Fig. 5, 6.

This hinge is set with two strong erect teeth, near the beak, in each valve, besides another which runs in the direction of the cartilage.

Gallina. *Linn. Syst. Nat. ed. Gmel.* 1. *p.* 3270. *Da Cost. Br. Conch. p.* 191. *t.* 12. *f.* 2. 2. *List. Conch. t.* 282. *f.* 120. *t.* 295. *f.* 131. *Knorr. vergn.* 5. *t.* 14. *f.* 2—5. *Chemn. Conch.* 6. *t.* 30, *f.* 308, 310.

TAB. XVII. Fig. 7, 8.

One valve is furnished with three teeth, the middle one thick and triangular, broad at the base, and the upper angle seated directly under the beak of the shell. Of the two other teeth, one is plate-like, and runs in the direction of the cordiform depression, whilst the other, much thicker, passes from the beak towards the cartilage. The other valve differs in having a middle tooth less triangular, and situated obliquely. In the room of the plate-like tooth there is one much more substantial.

exoleta. *Linn. Syst. Nat. ed. Gmel.* 1. *p.* 3284. *Penn. Br. Zool. No.* 49 *t.* 54. *f.* 49. *A. t.* 56. *f.* 49. *Da Cost. Br. Conch. p.* 187. *t.* 12. *f.* 5. 5. *List. Conch. t.* 292. *f.* 128. *Gault. Test. t.* 75. *f. F.* *Chemn. Conch. t.* 38. *f.* 402. 404.

TAB.

Tab. XVII. Fig. 9, 10.

The *Venus exoleta* is provided with three large teeth in each valve, one of which is double. This ſhell has the rudiment of a ſmall tooth ſeated at the baſe of one of the largeſt, on the ſide next the cordiform depreſſion, and in the valve oppoſite to that which contains the lateral double tooth.

decuſſata. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3294. *Da Coſt. Br. Conch. p.* 202. *t.* 14. *f.* 4. 4. *Liſt. Conch. t.* 423. *f.* 271. *Gault. Teſt. t.* 85. *f. L.*

Tab. XVII. Fig. 11, 12.

This ſhell has two grooved teeth in one valve, beſides a plain one. Theſe teeth receive another between them, from the oppoſite valve, which is likewiſe grooved, and has for its companions a ſmall plain tooth on one ſide, and the appearance of a tooth on the other. Young ſhells have three teeth in each valve. The intermediate one is conſtantly cleft, the others plain; at leaſt, in all the ſpecimens which I have met with.

craſſa. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3288. *Penn. Br. Zool. No.* 28. *t.* 48. *f.* 28. *Da Coſt. Br. Conch. p.* 194. *t.* 13. *f.* 4. *right hand.* *Liſt. Conch. t.* 299. *f.* 136.

Tab. XVII. Fig. 15, 16.

Although we have high authority for placing this ſhell among the *Veneres*, yet we find it in the Britiſh Zoology ranked among the *Tellinæ*; and, indeed,

if we are to judge by comparifon, it more properly belongs to that genus.

The hinge of the *V. craffa* is very plain and fimple, confifting of a grooved central tooth and two others, which are remote. One valve, however, has hardly the appearance of remote teeth, though the central tooth in both is equally ftrong.

undata. *Penn. Br. Zool. No.* 51. *t.* 55. *f.* 51.

TAB. XVII. Fig. 17, 18.

The hinge of the *V. undata* has a fmall central tooth fituated under the beak of the fhell, which fits into a triangular cavity in the oppofite valve. A deep fulcus runs from the beak in the direction of the cartilage flope.

ARCA.

Glycymeris. *Linn. Syft. Nat. ed. Gmel.* 1. *p.* 3313. *Penn. Br. Zool. No.* 58. *t.* 58 *f.* 58. *Da Coft. Br. Conch. p.* 168. *t.* 11. *f.* 2. 2. *Lift. Conch. t.* 278. *f.* 82. *Chemn. Conch.* 7. *t.* 57. *f.* 564.

TAB. XVIII. Fig. 1, 2.

" The hinge of the *Arca Glycymeris* is femicircular, and on each fide fet with a curved row of ftrong tranfverfe teeth, generally from five to ten on each fide."

This is Da Cofta's defcription, and is fo far juft; but he tells us that the centre of the hinge is quite

 fmooth,

ſmooth, and without teeth. This his figure contradicts, as well as two ſpecimens in my cabinet, the teeth of which meet in the centre, though their ſize is very much reduced. The drawing which I have given is from one of them.

Nucleus. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3314. *Da Coſt. Br. Conch. p.* 170. *t.* 15. *f.* 6. *right hand. Gault. Teſt. t.* 88. *f. R. Chemn. Conch.* 7. *t.* 58. *f.* 574. *a. b.*

TAB. XVIII. Fig. 3—6.

The beautiful arrangement of teeth in the hinge of this ſhell is not to be equalled by any other ſpecies on our ſhores. The regularity of their order and the elegance of their form make an accurate figure particularly deſirable. This I have attempted to give, to the beſt of my abilities, in a magnified repreſentation.

The hinge is to be ſeen in all its beauty only in live ſhells.

Of the remaining genera little need be ſaid, as the hinges are, for the moſt part, without teeth. I have, therefore, only figured one ſpecies of each genus, which, I preſume, will be thought ſufficient.

PECTEN.

pictus. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3325. *(oſtrea opercularis.) Da Coſt. Br. Conch. p.* 144. *t.* 9. *f.* 1, 2. 4, 5.

TAB.

TAB. XVIII. Fig. 7, 8.

" Hinge toothlefs, being only a trigonal cavity in the very centre of the commiffure or fummit of the fhell, which runs in a ftraight horizontal line." *Da Coft. Br. Conch. p.* 140.

OSTREA.

edulis. *Linn. Syft. Nat. ed. Gmel.* 1. *p.* 3334. *Lift. Conch. t.* 194. *f.* 31.

TAB. XVIII. Fig. 9, 10.

The fhells of this genus are connected together by a ftrong central cartilage. There is a variety with a rugofe appearance on each fide of the hinge, which is very well reprefented in Dr. Lifter's figure.

ANOMIA.

Ephippium. *Linn. Syft. Nat. ed. Gmel.* 1. *p.* 3240. *Penn. Br. Zool. No.* 70. *t.* 62. *f.* 70. *Da Coft. Br. Conch. p.* 165. *t.* 11. *f.* 3. *Lift. Conch. t.* 204. *f.* 38.

TAB. XVIII. Fig. 11, 12.

A fimple cartilaginous hinge with an oval cavity in the concave valve. Da Cofta mentions a claw in the other valve, which is not in my fpecimen.

MYTILUS.

edulis. *Linn. Syft. Nat. ed. Gmel.* 1. *p.* 3353. *Penn. Br. Zool. No.* 73. *t.* 63. *f.* 73. *Da Coft. Br. Conch. p.* 216. *t.* 15. *f.* 5. *left hand.*

TAB. XVIII. Fig. 13, 14.

I believe it has not hitherto been publicly noticed, that the common muſcle poſſeſſes teeth; ſuch, however, is the caſe, and their ſituation, cloſe to the beak of the ſhell, was firſt pointed out to me by Mr. Boys.

Theſe teeth are by no means regular, either in their arrangement or ſhape; nor is every ſhell provided with them. The ſpecimens in which I have found them are of a much larger ſize than the common, and generally make their appearance in the London markets in the depth of winter; but I am told they are not ſo much eſteemed as the ſmaller ones.

The teeth are from three to ſeven in number, and, when examined collectively, reſemble in figure and irregularity the knobs of a lobſter's claw.

PINNA.

muricata. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3364.

The two valves of the *Pinna* are merely united by a thin membrane, which forms a hinge of the moſt ſimple conſtruction, without even the veſtige of a tooth.

EXPLANATION OF THE PLATES.

TAB. XIV.

Fig. 1, 2. The hinge of the *Mya truncata.* (a) The great tooth. (b) The

(b) The correſponding depreſſion. (c) A ſmall tooth on one ſide of it.

Fig. 3, 4. The hinge of the *Mya arenaria.* (a) The great tooth. (b) A ridge grooved longitudinally. (c) A ſmall curve in the margin. (d) The cavity for the reception of the tooth.

5, 6. The hinge of the *Mya margaritifera.* (a) The rugged tooth. (b) Its cavity. (c) A ſharp ridge on one ſide of it, which paſſes into the cavity (d).

7. The hinge of the *Mya pictorum.* (a. a) The indented teeth. (b. b) The remote teeth.

8. A ſide view of one valve of the ſame.

9. The hinge of the *Solen Siliqua.*

10. The hinge of the *S. Vagina.*

11. *S. pellucidus.* (a) The bifurcated tooth. (b.b) The two other teeth in the ſame valve. (c) The two oppoſite teeth.

TAB. XV.

1, 2. The hinge of the *Tellina planata.*

3, 4. The ſame magnified*. (a. a) The large tooth in each valve. (b.b) Two ſmall teeth. (c) The lateral tooth.

5, 6. The hinge of the *Tellina incarnata.*

7, 8. The ſame magnified. (a.a) The two large teeth. (b.b) The two ſmaller ones. When the ſhell is placed horizontally theſe teeth appear very prominent, and the ſulcus in the large tooth is very apparent.

9, 10. The hinge of the *Tellina cornea.*

* The ſhells were, for the moſt part, magnified by Ellis's ſingle Aquatic Microſcope.

Fig.

Fig. 11, 12. The ſame magnified. (a.b) Two teeth which receive between them the triangular tooth (c). (d) A ſmall tooth which paſſes on the outſide of (a). (e. e. e. e) Lateral teeth.

13, 14, The hinge of the *Tellina rivalis.*

15, 16. The ſame magnified. (a.b) Two teeth which unite, and are continued to form an arch for the reception of the triangular tooth (c), on one ſide of which is a ſmall tooth (d). (e. e. e. e) Lateral teeth.

17,18,19. Hinge of the *Tellina bimaculata.*

20, 21. *Tellina ferverſis.* (a.b) Two erect teeth. In my ſpecimen, one is plain, the other notched. (c) A ſmall ridge dividing a depreſſion by the ſide of (a).

TAB. XVI.

1, 2. *Cardium aculeatum.* (a. a. b. b) Four erect teeth which lock together when the ſhell is cloſed. (c) A remote tooth which fits between (d. e), while (f) receives its oppoſite, (g).

3, 4. *Mactra lutraria.* (a) The great tooth. (b) The ſpoon-ſhaped cavity. (c) The place which receives the great tooth.

5, 6. *Mactra hians.* (a) The erect tooth. (b.b) The great cavity. (c. d) Two teeth which receive (a) between them. (e) A ſmall cavity for the grooved tooth (d). (f.f) A narrow ſulcus.

7, 8. *Mactra ſtultorum.* (a) The triangular tooth. (b) The rectangular one in the oppoſite valve. (c. c) The cavity for the cartilage. (d. d. d. d) Remote teeth.

9, 10. *Mactra alba* of the natural ſize.

11, 12. The hinge of the ſame magnified. (a. a) The ſpoon-ſhaped cavity. (b) A ſmall tooth. (c.c) Remote teeth.

Fig.

Fig. 13, 14. The hinge of the *Donax Trunculus.*

15, 16. The ſame magnified. (a) A thick ſulcated tooth received, when the ſhell cloſes, between (b. b). (c. c) Marginal teeth.

TAB. XVII.

1, 2. *Venus iſlandica.* (a) The great tooth which locks between (b. b), while the rugged tooth (c) fits into a hollow within the ſmall tooth (d). (e. e. e) Remote teeth.

3, 4. *Venus Chione.* Beſides the two ſtrong teeth in this ſhell, (a) and (b), there is a third, (c), which paſſes into the cavity (d). (e) A tooth grooved longitudinally.

5, 6. *Venus verrucoſa.* (a. b) Two thick teeth receiving (c) between them. (d) A large tooth which paſſes on the inſide of (e). (f) A thin tooth in the direction of the cartilage.

7, 8. *Venus Gallina.* (a.b) The two principal teeth. (c.d) Two ſmaller ones, of which (d) is plate-like. (e) A marginal tooth.

9, 10. *Venus exoleta.* (a) An erect tooth which locks between (b. b). (c) A thick channelled tooth received between (d. d).

11, 12. *Venus decuſſata.* (a) The two cleft teeth in one valve. (b) The ſame in the oppoſite. (c) The plain tooth.

13, 14. This ſhell is provided with a beautiful pectinated hinge, conſiſting of three teeth in each valve. Theſe teeth are placed in the moſt regular order, and the middle one, I believe, is conſtantly grooved. Frequently there is a channel in one of the other teeth, and ſometimes, though rarely, we meet with it in both.

When this ſpecies is found with only two teeth in one

valve and three in the other (as is fometimes the cafe), it muft be confidered as incomplete.

It was not till I began attentively to examine the hinges of Britifh bivalves, that this fhell appeared to me effentially different from the *V. decuffata*. We find it, not uncommonly, on the Sandwich fhore, from half an inch to one and a half or two inches in breadth, and fometimes marked on the outfide (in a zigzag manner) with all the ftrength and elegance of a foreign fpecimen.

This fpecies is broader, in proportion, than the *V. decuffata*, and the ftriæ are more delicate.

Fig. 15, 16. *Venus craffa.* (a) The two principal teeth. (b.b.b.b) Remote teeth.

17, 18. The hinge of the *Venus undata.* (a) The central tooth. (b) Its cavity.

TAB. XVIII.

1, 2. The hinge of the *Arca Glycymeris*, which in this particular fpecimen is furnifhed with an extraordinary number of teeth.

3, 4. *Arca Nucleus* of the natural fize.

5, 6. The hinge of the fame magnified.

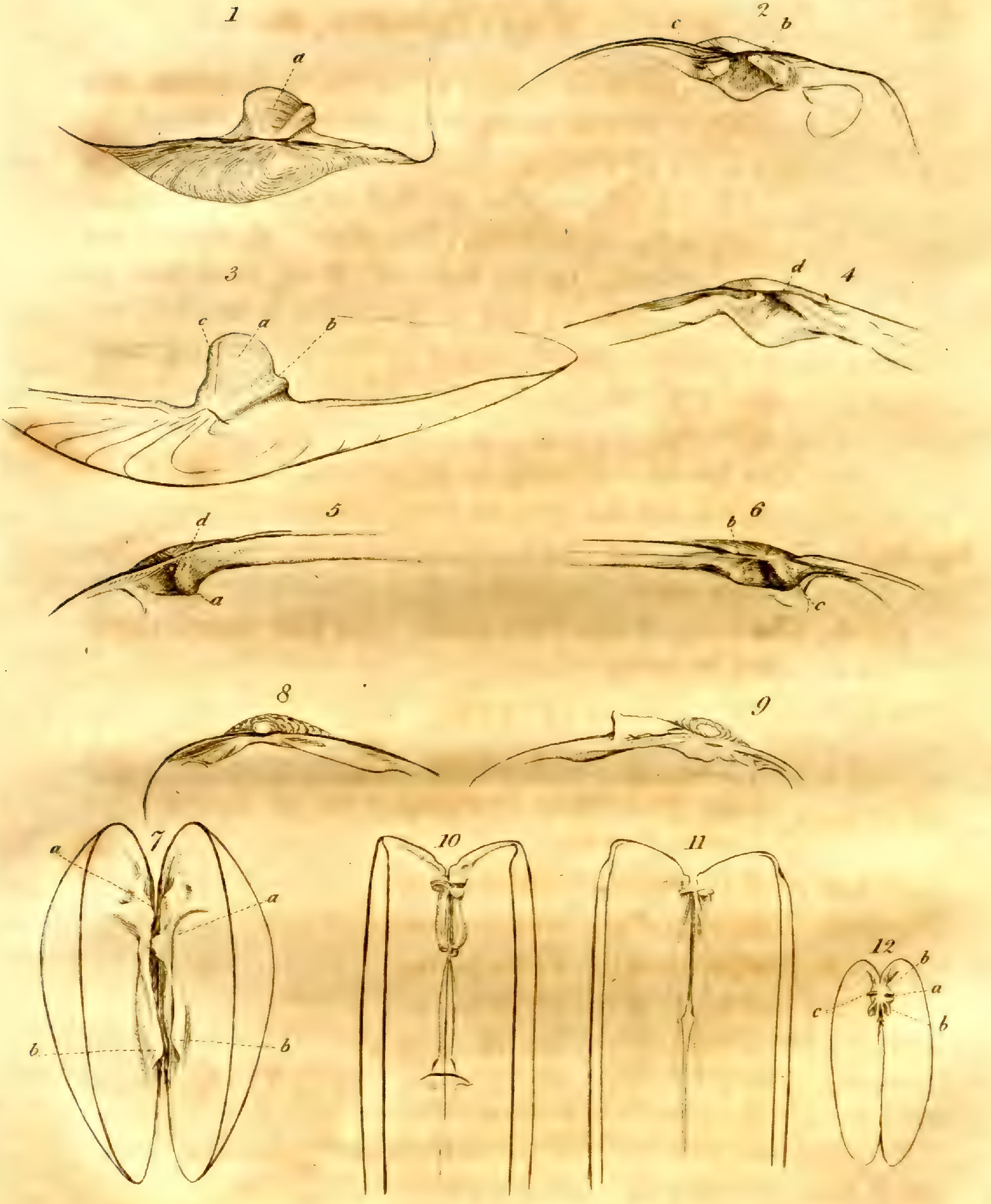
7, 8. The hinge of the *Pecten pictus.*

9, 10. The hinge of the *Oftrea edulis.*

11, 12. The hinge of the *Anomia Ephippium.*

13, 14. The hinge of the *Mytilus edulis.* (a. a) The fituation of the teeth.

XV. *Cata-*


1
a
2
c
b
3
c
a
b
4
d
5
d
a
6
b
c
8
9
7
a
a
b
b
10
11
12
b
a
c
b

1
2
5
6
c
b
a
3
b
a
7
b
a
4
b
a
8
9
10
13
14
e
b
a
11
e
d
15
c
e
e
d
c
e
e
12
e
16
b
a
e
19
17
18
a
c
20
b
21

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

Linn. Trans. VI. tab. 17. p. 176.

2
1
4
3
5
6
7
8
9
10
11
12
13
14
a
a

XV. *Catalogue of the more rare Plants found in the Environs of Dover, with occasional Remarks.* *By Mr. Lewis Weston Dillwyn, F.L.S.*

Read March 3, 1801.

HAVING spent a considerable proportion of the last three years at Dover, and preserved a list of the plants which I found in its neighbourhood, I submit to the Linnean Society the following selection of those which, from their scarcity or any other circumstance, more particularly attracted my attention. I flatter myself it will not be unacceptable to such botanists as may visit that part of the kingdom, and that it may also serve in some measure to correct the habitats, given in some respectable works, of a few plants which, if not now extinct in the places assigned to them, have at least eluded a diligent search on my part.

Higham Lodge, Feb. 16, 1801.

Salicornia herbacea, with *Aster Tripolium*, *Eryngium maritimum*, and most of the more common sea-shore plants, in or about Sandwich salt marshes.

Veronica montana. In most of the woods about Dover.

Valeriana rubra. On old walls of the Elms, where it has propagated itself for time immemorial, but is probably of garden origin.

Iris fœtidissima. On the road from Dover to Folkstone, about half a mile from Archcliff Fort, and in many other places in the neighbourhood.

Schœnus Mariſcus. In Ham Ponds near Eaſtry.

——— *compreſſus.* In boggy ground at Cockſhill, and about Ham Ponds.

Scirpus pauciflorus. About Ham Ponds.

Phalaris arenaria. On the ſandy ſhores of Deal, Sandwich, and Dimchurch.

Aira criſtata. On Sandwich Flats.

Poa diſtans. On Sandwich Flats and about Lidden-ſpout, near Dover.

—— *bulboſa.* Among the ſand-hills between Deal and Sandwich.

Arundo colorata, foliis variegatis ſtriatis. In a ditch in Romney marſh near Dimchurch.

Rotbollia incurvata. On the ſhore a little north of Sandown Caſtle, and near Lidden-ſpout.

Triticum loliaceum. About Sandwich Salt-pans.

Aſperula cynanchica. Common on the hills about Dover.

Rubia peregrina. On the cliffs eaſt of the Caves, and in Langdon-bay.

Borago officinalis, floribus albis. At the entrance into Sandwich from Deal, and about Lymne Caſtle.

Convolvulus Soldanella. About Deal and Sandwich, plentifully.

Verbaſcum nigrum. On the ſides of the London road on Lidden-hill, about four miles from Dover.

Vinca minor. In great abundance in the lane about half a mile weſt of the Elms.

—— *major.* In the lane adjoining Eaſt Langdon church; near Eyethorne, and in the lanes at the back of Hythe.

Gentiana Amarella. Plentiful on the Dover hills.

Bupleurum tenuiſſimum. W. Boys, Eſq. F.L.S. informs me that Hudſon found this on the bank of the river, about half a mile N.E. of Sandwich; but I looked for it there in vain.

Crithmum maritimum. On the cliffs about Dover.

Oenanthe pimpinelloides. Ditches in Sandwich and Romney marſhes.

Smyrnium Oluſatrum. Common in the neighbourhood of Dover.

Narciſſus poeticus. Found near Hougham, by the Rev. J. Lyon, F.L.S. to whom I am much obliged for the aſſiſtance he gave me in my botanical reſearches.

Juncus maritimus. Near Dimchurch on the road to Romney.

Frankenia lævis. On the cliffs about Archcliff Fort.

Aliſma Damaſonium. In a pool under the cliff between Folkſtone and Sandgate, ſparingly.

—— *ranunculoides.* Ditches between Ham Ponds and Eaſtry, and in the boggy grounds about Wingham.

Epilobium anguſtifolium. In the woods about half a mile weſt of River Poorhouſe.

Chlora perfoliata. Common in the neighbourhood of Dover.

Paris quadrifolia. In the orchard at the Elms, and in moſt of the woods about Dover; often with 5, 6, or 7 leaves.

Dianthus Caryophyllus. Not 'on Sandown,' and very ſparingly 'on Deal Caſtle.'

Silene nutans. On the cliffs about Dover, abundantly, and on Sandgate Caſtle. *S. paradoxa* is not, I believe, to be found in the neighbourhood.

—— *maritima.* On the beach between Sandgate and Hythe, where I have found ſome plants with ripe ſeed in the middle of June, and ſome in full flower in the beginning of November.

—— *conica.* Common on the range of ſand-hills beginning at Deal and running eaſtward of Sandwich; and on the ſand-hills directly 'oppoſite the Warren-houſe at New Romney' ſparingly.

Arenaria marina. Common at the Caves, &c. The ſeeds are roughiſh. Seldom more than one in ten of thoſe in each capſule are furniſhed with a margin, which is broad, membranaceous,

 white,

white, and ftriated; and I never obferved the rudiment of one in more than half the other feeds.

Sedum anglicum. About Sandown Caftle, and on the beach about two thirds of the way from Dover to Folkftone.

Lychnis dioica, floribus albis pleniffimis. On the fides of the north end of the Old Haven at Sandwich.

Euphorbia paralias. Under the South Foreland, and in great abundance a little weftward of Shakefpear's Cliff.

Papaver hybridum. Edge of the cliff near Archcliff Fort.

——— *Argemone β.* Near Sandown Caftle.

Aquilegia vulgaris. About the ruins of Raddigund's Abbey.

Ranunculus Lingua. In the Old Haven at Sandwich, and in and about Ham Ponds.

Antirrhinum fpurium. Corn-fields near Ramfgate, on the road to Margate.

——— *majus.* On old walls, but not 'on the cliffs of Dover.'

Digitalis purpurea. On the beach near Hythe, and in large quantities on the beach near Dungenefs Light-houfe.

Orobanche ramofa. Found by the Rev. J. Lyon near Hougham.

Crambe maritima. In St. Margaret's and Langdon bays; and very plentifully on the beach, about half way from Dover to Folkftone.

Braffica Oleracea. About the Caves and Shakefpear's Cliff.

Erodium maritimum. Found by my friend, Jofeph Woods, jun. and myfelf on the walls of Sandgate Caftle.

Geranium lucidum. On the beach about half way between Dover and Folkftone; and about the ruins of Lymne and Saltwood Caftles, near Hythe.

——— *columbinum.* On the hills about Dover, fparingly.

Malva mofchata, floribus albis. In fields near Eyethorne.

Pisum maritimum. On the beach between Walmer Castle and Kingsdown.

Lathyrus Nissolia. About the 65th mile stone on the sides of the London road.

——— *sylvestris.* In the dark lane south of the main entrance into Waldershare Park.

Hippocrepis comosa. Common on the hills about Dover.

Trifolium ornithopodioides. ⎫
——— *subterraneum.* ⎬ Between Dimchurch and New Romney.
——— *scabrum.* ⎭

Trifolium maritimum. In Sandwich salt marshes.

——— *glomeratum.* ⎫
Medicago polymorpha β. ⎭ Near Sandown Castle.

Hypericum androsæmum. In most of the woods about Dover. In the wood on Lymne-hill, plentifully.

Crepis biennis. On the heights near the Horse Barracks.

Carduus eriophorus. About a farm called Polton, near Raddigund's Abbey; and about the ruins of Lymne Castle.

——— *acaulis.* Abounds on the hills about Dover.

Orchis ustulata. In the Foreland Meadow, and on the hills about Dover, sparingly.

——— *militaris.* Found by the Rev. S.L. Jacobs, F.L.S. near Chilton, on the side of the path leading from Bushy Rough to Alkham.

——— *conopsea.* Very luxuriant on the hills about Dover. I counted 229 flowers in one spike.

Ophrys Nidus avis. Wood between Alkham and Ewel Minnis.

——— *spiralis.* In the Foreland Meadow, and a little east of the Caves.

——— *Loeselii.* Boggy ground about Ham Ponds.

——— *anthropophora.* Bank westward of Crabble.

——— *muscifera.* Sunny bank at the side of Coombe Wood, and, as

I am

I am informed by the Rev. J. Lyon, in ſeveral other ſimilar ſituations about Dover.

Ophrys apifera. Common in ſunny expoſures about Dover: on a barren bank in the lane running eaſt of Barton, plentifully.

—— *aranifera.* On the hills about Dover; ſome years much more plentifully than others.

Serapias latifolia. In the wood between Alkham and Ewel Minnis; and in a wood between Alkham and Raddigund's Abbey.

—— *longifolia.* Boggy ground about Ham Ponds, marſhes about Hacklinge between Deal and Sandwich, and in Wingham marſhes.

Carex pulicaris. Boggy ground about Ham Ponds.

—— *arenaria.* Sand-hills about Deal, Sandwich, and Romney.

—— *diviſa.* Near Ham Ponds and in Sandwich marſhes.

—— *pendula.* Wood on Lymne-hill, abundantly.

—— *diſtans.* Sandwich marſhes and about Ham Ponds.

—— *pſeudo-cyperus.* Ditches between Deal and Sandwich, and in Sandwich Old Haven.

Urtica pilulifera. Is extinct at 'Old Romney;' but a little ſouth of Lyd Church-yard grows plentifully.

Myriophyllum verticillatum. Ditches between Deal and Sandwich.

Salix argentea. A little north of Sandown Caſtle, plentifully. I am obliged to Dr. Smith for its name.

Hippophaë rhamnoides. With the laſt in abundance between Folkſtone and Sandgate, Undercliff, and a little weſt of St. Margaret's Bay.

Atriplex littoralis. About Ramſgate pier, and on the ſhore a little north of Sandwich ſalt-pans.

Equiſetum fluviatile. In Folkſtone Cherry orchard.

Aſplenium Ceterach. On the wall at the entrance into Ewell Church-yard.

Fontinalis fecunda. On trees weft of Buckland Church.

Mnium undulatum. }
——— *hornum.* } In Walderfhare Shrubbery, in fruit abundantly, May 14, 1799.

Bryum unguiculatum. On the outfide of the eaftern inner wall of Dover Caftle, fparingly.

——— *triquetrum β. Hudfon.* Bank of the rivulet near Cockfhill.

Hypnum lutefcens. Not uncommon on the hills in the neighbourhood of Dover.

——— *Smithii.* On the trees a little north of the Half-way Houfe between Dover and Canterbury; and plentifully on the trees in Walderfhare Park. Early in April, 1800, the veils appeared with upright hairs, agreeing with thofe of the genus *Orthotrichum*; and I found one with a capfule, but I do not think any came to perfection.

——— *proliferum.* In fruit, near Barham, May 5, 1799.

——— *alopecurum.* Hedge-bank in the dark lane eaft of Charlton, in fruit, November 26, 1799.

——— *fquarrofum.* }
——— *purum.* } About the wood near Raddigund's Abbey, in fruit, November 1, 1799.

——— *filiforme.* On trees near Bier.

——— *tenellum.* (*Dickfon, fafc.* 4.) On old walls at the Priory, and other walls about Dover.

Fucus fanguineus. Frequently wafhed on the Dover fhore. It is in fructification from December to the latter end of March.

——— *finuofus.* }
——— *Hypogloffum.* }
——— *dafyphyllus.* } Sometimes, but not frequently, found in the neighbourhood.

——— *membranifolius β.* Rocks near the Caves, fparingly.

——— *fibrofus* }
——— *bulbofus.* } Sometimes wafhed on fhore after ftorms.

——— *crenulatus.* Not unfrequent 'inter rejectamenta;' and at a neap tide

tide I found it on the rocks oppofite Shakefpear's Cliff near low water mark.

Fucus loreus. Abounds on the fhore after ftorms.

—— *edulis.* Rocks near the Caves, plentifully.

—— *plumofus.* Rocks about Dover, common.

—— *nodofus.* Rocks at Folkftone, abundantly.

—— *Filum.* On the Dover beach only after ftorms.

—— *radiatus.*
—— *confervoides.*
—— *fubfufcus.*
—— *articulatus.*
—— *Opuntia.*
} With many of the more common fpecies, on the rocks about Dover. Between *F. confervoides* and *F. albidus* I can find no fpecific difference, and I believe *F. Opuntia* is only *F. articulatus* in a young ftate.

Ulva dichotoma.
—— *rubra.*
} Are fometimes found on the beach at Dover.

Conferva equifetifolia.
—— *verticillata.*
—— *fucicola.*
—— *elongata.*
—— *ciliata.*
—— *nodulofa.*
—— *diaphana.*
—— *byffoides.*
} With many of the more common fpecies, are frequently met with on the Dover rocks and beach, as well as feveral which, in the prefent ftate of our knowledge of this genus, cannot be arranged.

—— *gelatinofa.* In the rivulet which runs acrofs the Victualling-Office yard, and other places about Dover.

—— *glomerata.* About the wooden bridge a little beyond Bufhy Rough.

Agaricus pfittacinus. Wood near Raddigund's Abbey.

—— *varius.* Var. 6, of Withering, as alfo one agreeing with Var. 7. except in having the pileus white, and

Peziza inflexa, in the fame wood near Raddigund's Abbey.

XVI. *De-*

XVI. *Descriptions of some singular Coleopterous Insects.*

By Charles Schreibers, M.D. Deputy Professor of Natural History in the University of Vienna.

Read April 7, 1801.

LUCANUS ÆNEUS.

TAB. XX. Fig. 1.

LUCANUS oblongus æneus; mandibulis exsertis, brevibus, validis, recurvis, interne ferrugineo hirtis; capite parvo, transverso, subbicornuto; thorace magno, convexo, transverso, margine utrinque angulo deflexo; elytris subcylindricis, convexis, subrugosulis; tibiis anticis latioribus, dentatis, interne lamina cornea falciformi munitis.

Caput transverse oblongo quadratum, breve, thoraci multo angustius, planiusculum, punctis excavatis scabrum, nitidum viridi æneum, interdum ex cupreo incurvatum; triangulo medio magno subexcavato marginibus elevatis glabris, lateralibus postice conniventibus, antice ad latera marginis anterioris ante oculos subprominentibus; hinc caput subbicornutum. Margo anticus subemarginatus.

Oculi laterales, ovati, brunnei.

Antennæ breves, fusco-nigrescentes, glabræ, nitidæ, ante oculos insertæ, thoraci breviores, uni-articulatæ, lateraliter expansæ vel subfissiles, extrorsum crassiores, apice pertusæ, 10-articulatæ: articulo primo maximo, elongato, clavato; 5 insequentibus parvis subæqualibus, submoni-

submoniliformibus; ultimo magno, clavato, subperfoliato, foliis 4, quorum primum minimum haud conspicuum. TAB. XIX. fig. 5.

Mandibulæ porrectæ, capite longiores, validæ, recurvæ, apice latiores, hic truncatæ & emarginatæ, hinc bidentatæ, dente apicis & medio ubi recurvæ, spatio inter hos subdenticulato. Glabræ sub lente haud distincte punctatæ, interne pilis densis ferrugineis hirtæ, obsolete viridi æneæ subnitidæ marginibus nigrescentibus. TAB. XIX. fig. 1—3.

Palpi quatuor filiformes, glabri, brunnei, crassiores; posterioribus 3-articulatis, articulis fere æqualibus, primo minimo, 2do subclavato, 3tio obtuso-acuminato; subincurvis brevioribus: anterioribus longioribus 4-articulatis, articulo primo minimo, 2do elongato subclavato, 3tio parvo submoniliformi, ultimo longiori, obtuso-acuminato. TAB. XIX. fig. 6.

Maxillæ breves, membranaceæ, setosæ. TAB. XIX. fig. 4.

Labium superius nullum; inferius corneum, rotundum, integrum.

Thorax magnus, brevis, elytris latior, convexus, margine utrinque angulo deflexo; margine postico parum sinuato, marginibus lateralibus subreflexis; nitidus, viridi-æneus, in medio subtilissime & sparsim excavato-punctatus, cæterum glaber puncto excavato majori laterali supra angulum deflexum.

Scutellum magnum, semicirculare, planum, glabrum, concolor.

Elytra brevia, parum convexa, oblongo-ovata, subcylindrica postice parum angustiora, non connata, marginata, subpunctata, subrugosula, nitida, viridi-ænea, totum corpus ambientia, margine subreflexo, tuberculo lævi versus apicem.

Corpus alatum, alis fuscis; subtus æneum, plus minus ex viridi, nitidum, punctatum, subvillosum pilis brevibus sericeis hinc inde præsertim ad latera segmenti primi abdominis, densioribus, ex cinereo flavescentibus.

Abdomen

Abdomen ſegmentis 6, primo (pectore) maximo, craſſo, convexo, acumine brevi porrecto in margine ſuperiori inter femora media; reliqua ſegmenta brevia anguſta, marginibus piceis.

Femora antica craſſa, valida, cylindrica; media cylindrica, graciliora paulo; poſtica compreſſa latiora; omnia nitida, viridi-æneа ſubpunctata, ſubhirta.

Tibiæ anticæ (Tab. XIX. fig. 7.) apice dilatatæ, paulolum compreſſæ, extrorſum dentatæ, dentibus nigreſcentibus 6—7; apice truncatæ, oblique emarginatæ, pilis ferrugineis in faſciculum acutum dentiforme collectis, longioribus, & prope hoc lamina ſat magna, cornea, radiata, falciformis, nitida picea ad angulum internum; tibiæ reliquæ graciles, ſubcylindricæ, ad articulationem tarſorum interius biſpinoſæ; omnes punctatæ, ſubhirtæ, nitidæ viridi-æneæ.

Tarſi 5-articulati, articulis 4 primis moniliformibus, ſubtus ferrugineo-hirtis, ultimo longo, clavato, incurvo; omnibus glabris nitidis, nigro-piceis, unguibus 2 ſat validis, incurvis, acutis, & inter hos in vagina condita ad libitum porrigenda ſpina gracilis apice diviſa in duas multifidas.

Varietas.

Paulo minor & color viridi-æneus cum nitore aureo pulcherrimo.

Mandibulæ longiores, prolongatæ, minusque recurvæ, graciliores, flexuoſæ, punctatæ, ſplendentes, nitidiſſimæ, aureæ, apice marginibusque cyaneis, interne pilis denſiſſimis ferrugineis hirtæ.

Structura cæterum mandibularum conſpicue differt & difficillime eſt deſcribenda. Apex ſubrecurvus, latior, bis emarginatus hinc tridentatus, margineque inferiori interne in medio unidentato, dente ſat valido, acuto, antrorſum ſpectante. Tab. XIX. fig. 9—11.

Inter palpos rudimenta penicillorum, *Lucanis* ad inſtar, aſt non

porrecta, & reliquis plane deficientia, ubi spatium pilis tantum impletum.

Cætera omnino correspondent. Elytra levia minime punctata.

Femina.

Ejusdem habitus & magnitudinis, paulo tamen angustior & magis adhuc cylindrica. Color nigro-æneus cum nitore violaceo.

Triangulum capitis minus distinctum.

Mandibulæ multo breviores, fere erectæ, parum incurvæ, apice paulo crassiores, & hic oblique antrorsum emarginatæ & excavatæ; punctatæ, nitidæ nigrescentes, interne pilis ferrugineis, sed minus quam in prioribus, hirtæ.

Thorax magis punctatus & scaber.

Tibiæ anticæ (Tab. XIX. fig. 8.) multo graciliores, quamvis apice parum dilatatæ, subsulcatæ, punctatæ, extrorsum dentatæ, dentibus 8, 9 sensim magnitudine decrescentibus paulo validioribus; apice minus emarginatæ, pilis aliquot ferrugineis solitariis denteque sat longo, acuto, loco laminæ corneæ, ad angulum internum.

Tibiæ mediæ & posticæ extrorsum spinosæ.

Cætera conveniunt.

Patria, Nova Hollandia; Insula Norfolk Maris Pacifici.

Ex Museo D. Francillon.

Hospitatur in Museis D. Banks, D. Marsham, D. Parkinson.

Descripsit jam hoc insectum clar. Fabricius in Systemate suo Entomologiæ emendato, *t.* i. *p.* i. *p.* 2. sub nomine *Lethri ænei*, ex Museo D. Banks, ubi dicit: "Forte proprii generis," cum ob defectum palporum genus rite determinare non potuisset; cæterum nimis obiter specimen examinasse videtur dicendo, elytra "haud connata," quæ primo intuitu perfecte separata apparent. Minime ad genus *Lethri* referendum est, cum non solum toto habitu, sed corpore alato,

alato, elytris ſeparatis, tota antennarum, partiumque oris omnium conditione omnino differt. His potius cum *Lucanis* convenit, ſaltem cum aliquis, nam magnam inter varias hujus generis ſpecies obſervavimus characterum diſcrepantiam; differt autem a communi earum conditione habitu, capite parvo, thorace convexo, lateribus deflexis; elytris convexis; antennis articulo primo minus gracili non arcuato, ultimo minus perfoliato; labio inferiori integro corneo; palpis craſſioribus, poſterioribus articulis non ſubæqualibus; penicillorum, ſaltem perfectorum, abſentia, &c.

Proprium hinc certe genus conſtituere videtur, hancque ob rationem ſollicitam partium characteriſticarum deſcriptionem dedimus; pro tempore autem, cum ſingula ſit ſpecies, ad *Lucanos* retulimus.

SCARABÆUS PROBOSCIDEUS.

TAB. XX. Fig. 2.

Ratione habitus, *Copris*, recentiorum.

Ratione capitis thoracisque conditionis pertinet ad familiam ſecundam *Scarabæorum* Fabricii.

SCAR. ſcutellatus ferrugineus; thorace mutico ſubretuſo; clypeo poſtice bilobato, antice in medio prolongato, cornu brevi, erecto, obtuſo, emarginato; apice ſubemarginato in roſtrum gracile, ſubattenuatum, ſubdecurvum, terminante.

Color totus ferrugineus, interdum obſcurior & nigricans.

Clypeus thoraci multo anguſtior, planiuſculus, poſtice ad utrumque latus in lobum ocularem dilatatus, antice in medio prolongatus in laminam cujus margines laterales per lineam elevatam ſupra caput ad baſin uſque ſeſe extendunt, & ſic lobos poſticos laterales a clypeo ipſo diſtinguunt. In laminæ hujus medio, a thorace conſiderato,

ſiderato, cornu breve ſeu tuberculum erectum, apice obtuſo-emarginatum. Lamina ipſa verſus apicem dilatatur, & hic ſubemarginata prolongatur in roſtrum longitudine totius clypei, gracile, ſubattenuatum, quadrangulare, ſubdecurvum, apice craſſiori marginato proboſcideo, furcato, furcis lateralibus deorſum ſpectantibus apice paulo magis divaricantibus. Roſtriformis hæc clypei prolongatio valde ſingularis eſt ſolida atque imperforata. Subtus lamina clypei in medio elevata, paulolum ſupra os fulcro verticali, longitudine 3 linearum, apice furcato, munita eſt. TAB. XIX. fig. 12.

Clypeus præſertim antice & roſtrum ſub lente ſcabriuſcula; cæterum ſubnitida, ferruginea, marginibus omnibus, apice tuberculi medii, apice furciſque roſtri, nigris. Latera clypei totius præſertim poſtice pilis ferrugineis in faſciculos longos, acutos collectis.

Antennæ ferrugineæ, clava magna ovato-rotundata, ſublamellata.

Thorax brevis, elytris latior, valde convexus, ſubretuſus, inermis, forma & conditione feminæ *Scar.* 4-*dentis*, *Cyclopis*, &c. ſimilis, at non ad margines laterales anticos dilatatus ut in *Cyclope.* Ad latera punctis impreſſis ſubſcabriuſculus, antice & in medio glaber, macula rotundata impreſſa ſupra marginem lateralem; marginibus omnibus elevatis, lateralibus faſciculis piloſis, ferrugineis acuminatis, ciliatis; margine poſtico rotundato-truncato. Cæterum ſubnitidus, ferrugineus.

Scutellum magnum, triangulare, planum, concolor.

Elytra valde convexa, totum corpus ambientia, excavato punctato-ſtriata, ſubnitida, ferruginea.

Corpus ſubtus ſubſcabriuſculum, obſolete ferrugineum, pilis ſat longis ferrugineis undique hirtum.

Pedes concolores, hirti; femoribus anticis & poſticis incraſſatis; tibiis anticis extrorſum dentatis, dentibus 5 validis ſenſim decreſcentibus

nigris;

nigris; tibiis mediis & pofticis triquetris, valde fpinofis; tarfis hirtis verfus infertionem nigro marginatis.

Femina incognita.

Magnitudine *Scarabæo Cyclopi* accedit, *Sc. quadridentem* multum fuperat.

Habitu & forma immo & colore *Scarabæis Cyclopi*, *Coriphæo* & *quadridenti* accedit.

Patria, Nova Hollandia.

Ex Mufeo D. Francillon.

SCARABÆUS DYTISCOIDES.

TAB. XX. Fig. 3.

Ratione capitis thoracisque conditionis pertinet ad familiam fextam *Scarabæorum* Fabricii.

SCAR. exfcutellatus, muticus, niger, opacus; clypeo bidentato; thorace fubplaniufculo, conico; elytris latis, planis, apice rotundatis, dentatis, ftriatis; tibiis anticis fexdentatis, pofticis ciliatis; tarfis mediis longiffimis.

Clypeus fubovatus, poftice convexiufculus, antice fubexcavatus, fub lente punctis minimis fubfcabriufculus, niger, opacus; margine laterali hirto, parumper reflexo, antico fubemarginato & in medio bidentato, dentibus longioribus, acutis, fubreflexis, approximatis, antrorfum divergentibus.

Antennæ nigræ, clava cinerafcente.

Thorax fubplaniufculus, conicus, poftice elytrorum fere latitudine, antice multo anguftior, utrinque truncatus, paulo latior quam longus, lateribus antice fubinflexis; niger opacus, fub lente fubfcabriufculus.

Scutellum

Scutellum nullum diftinctum, aft elytra hoc loco fpatium triangulare fat magnum haud impletum formant.

Elytra ovata, plana, totum corpus tegentia, apice rotundata, tenuia, opaca, nigra, fub lente punctis minimis elevatis crenulata, longitudinaliter ftriata, ftriis leviter impreffis 7 in utroque, fulcoque elevato verfus marginem lateralem. Dentes 7 in utroque verfus apicem, quorum unusquisque inter duas ftrias impreffas parum oblique pofitus fat validus, bafi latior, triangularis, compreffus.

Anus magnus truncatus, triangularis ut in *Scar. facro* & *gibbofo*, margine utrinque elevato, glaber, opacus, niger, fub lente crenulatus.

Corpus fubtus nigrum, nitidum, *Sc. facro* fimile.

Femora antica valida, compreffa, clavata; media paulo graciliora compreffa, fubcurvata; poftica graciliora compreffa; omnia glabra nitida, marginibus pilis longis, atris, hirtis.

Tibiæ anticæ hirtæ, extrorfum dentatæ, dentibus 6, validis longis acutis, 3 primis longiffimis fere æqualibus.

Tibiæ mediæ graciles, fubtriquetræ, hirtæ, fpinofæ, apice fpinis duabus longioribus.

Tibiæ pofticæ validiores, triquetræ, pilis denfis, longis, atris ad margines ut in *Sc. facro*, ciliatæ, apice fpina unica munitæ.

Tarfi hirti, fpinofi, antici breviffimi; poftici paulo longiores; medii longiffimi, triplo pofticis & quidem ipfis tibiis longiores.

Magnitudine *Scar. facrum* æquat.

Habitu & forma *Sc. facro* & fimilibus accedit, aft thoracis figura fingulari conica, angufta, elytris complanatis pedibusque multo longioribus multum differt, & primo intuitu *Dytifci* fimilitudinem refert.

Patria, Brafilia.

Ex Mufeo D. Francillon.

CETONIA Philipsii. (Scarabæus *Linn.*)

Tab. XX. Fig. 4.

Cet. clypeo elongato, emarginato, atro; thorace planiuſculo piceo marginibus atris; elytris planiuſculis, atris, ſulcatis, ſulcis excavatis latis ex fulvo hirtis.

Clypeus magnus, planus, elongatus, cylindricus, apice emarginatus, denſim excavato punctatus, margine laterali elevato, ater, opacus.

Oculi laterales fuſcoflaveſcentes.

Antennæ atræ, ſtructura communi, at articulus primus valde magnus.

Thorax planiuſculus, antice anguſtior, ad latera parum ſinuatus, poſtice latior, at elytris paulo anguſtior, margine poſtico ſinuato, laterali ſubreflexo; leviter excavato punctatus, magis conſpicue ad latera, haud nitidus piceus, marginibus omnibus atris.

Scutellum magnum, planum, triangulare, atrum.

Elytra plana, corpore haud breviora, apice paulo anguſtiora quam baſi, haud nitida, glabra, atra, ſulcis in utroque quatuor longitudinalibus leviter excavatis, nec baſin nec apicem attingentibus, pilis brevibus fulvis repletis; duobus exterioribus haud diſtinctis, interiori breviſſimo, medio latiſſimo, cujus margines elevatæ verſus apicem connivent & tuberculum leve formant.

Corpus ſubtus atrum, opacum, craſſum pilis fuſcis hinc inde hirtum, ſterno porrecto, compreſſo, ſubtriangulari.

Pedes atri, femoribus anticis hirtis brevioribus, poſticis 4 incraſſatis, compreſſis; tibiis anticis brevioribus, ſubpalmatis extrorſum tridentatis; mediis et poſticis cylindricis, extrorſum in medio uniſpinoſis, apice 4-ſpinoſis; tarſis 5-articulatis.

Magnitudine *Cetoniam* (Scarabæum *Linn.*) *faſcicularem* multum ſuperat.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon.

SILPHA LACRYMOSA.

TAB. XX. Fig. 5.

SILPH. atra; thorace plano in medio atro tuberculato, lateribus late marginatis teſtaceis; elytris ſubconvexiuſculis medio atris, apice & ad latera teſtaceis, maculis oblongis deorſum incraſſatis, elevatis.

Caput deflexum, oblongo-quadratum, glabrum, opacum, atrum, linea transverſa, elevata, ſubſinuata cervicis inter oculos, aliaque haud diſtincta frontali, media, longitudinali.

Oculi laterales, ovati, teſtacei.

Antennæ ſubhirtæ, atræ, articulis 3 ultimis rufis.

Thorax planiuſculus, latus, margine antico emarginato, poſtico ſubſinuato-truncato, laterali rotundato, ſubreflexo; antice parum anguſtior, & tota forma *Silphæ thoracicæ* & ſimilibus accedens; glaber, opacus, minime nitidus, in medio ater & hic tuberculis aliquot irregularibus, parum nitidis notatus, ad latera teſtaceus, colore thoraci *Silph. thoracicæ* omnino ſimili, at minime nitido, per atrum in medio emarginato.

Scutellum magnum, planum, ſubexcavatum, triangulare, atrum.

Elytra parum convexa, baſi thoracis latitudine, apice latiora dilatato-rotundata, margine laterali ſubexcavato, ſubreflexo; in medio atra, opaca, lateribus & apice late teſtaceis, maculis elevatis paulolum nitidis, glabris, lacrymoſis, in utroque 10. Tres ad ſuturam ſuperiori lineari, media infra hanc, oblonga deorſum craſſiori, tertia minori, ovata; quatuor in medio, prima lineari, ſecunda oblonga deorſum incraſſata, tertia oblonga valde incraſſata, ſimillima guttulæ ſeu lacrymæ deploranti, ultima oblonga, obliqua, interdum diviſa verſus apicem. Tres exteriores ſubrotundæ minimæ.

4 Omnes,

Omnes, ultima apicis excepta, diſcum atrum obſident. Plurimæ earum ob figuram oblongo-ovatam deorſum incraſſatam ſimiles ſunt guttulis decadentibus ſeu lacrymis, & tres ſeries longitudinales haud regulares conſtituunt.

Color ater diſci elytrorum tantum a corpore tranſparente, ſic ut thoracis, maculæ autem atræ per ſe.

Corpus ſubtus cum pedibus atrum, ſubnitidum.

Pedis poſtici longiores, antici breviſſimi.

Magnitudo *Silph. littoralis* ut habitus, quamvis elytra apice latiora & thoracis forma diverſa.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon.

Hoſpitatur etiam in Muſeo D. Marſham.

CLERUS FASCICULATUS. (ATTELLABUS *Linn.*)

TAB. XX. Fig. 6.

CL. niger; thorace ſubgloboſo, ſcabro, pubeſcente, atro; elytris elongatis, cylindricis, porcatis, nigris, baſi faſciculis duobus piloſis, erectis, faſciaque lata tranſverſa, albomarginata, ſubpubeſcente, nitida verſus apicem, atris; antennis flaveſcentibus.

Caput thoraci inſertum illoque paulo anguſtius, margine antico ſubemarginato, laterali antice ante oculos elevato; punctis excavatis, denſis, ſcabrum, ſubpubeſcens præſertim ad latera pilis longioribus atris, hinc inde cineraſcentibus; ſubnitidum, atrum.

Oculi laterales, ovati, nigro-picei.

Antennæ craſſæ, moniliformes, extrorſum craſſiores, articulis 3 ultimis majoribus, *Clero apiario* ſimiles, flaveſcentes.

Palpi quatuor, ſecuriformes omnes, quamvis articulus ultimus anticorum minor. His differt a communi hujus generis conditione

 partium

partium oris, & convenit cum *Cl. apiario* pari modo difcrepante.

Thorax convexus, fubglobofus, immarginatus, antice truncatus, poftice rotundatus, punctis impreffis fcaber, pilis atris & hinc inde cinerafcentibus, pubefcens, hirtus, ater.

Scutelli loco punctum villofum, cinereo-album.

Elytra convexa, fubelongata, cylindrica, apice rotundata, humeris paulo prominulis, opaca, nigra, punctis majoribus, profunde excavatis, denfis, catenulatis, porcata; fafciculo in utroque, magno, erecto conico, atro, verfus bafin a pilis denfis conflato, alioque multo minori, haud diftincto infra hoc & fupra medium elytri, cinereo; fafciaque lata, communi, tranfverfa, finuata, fubpubefcente, fubnitida, atra pilis cinerafcentibus marginata, poftica, apicem excludente. Macula parva, glabra, lutea ad marginem exteriorem in directione parallela cum fafciculo cinereo, aliaque paulo majori tali infra illam ad marginem & angulum externum, fuperiorem fafciæ.

Corpus atrum, hirtum fubpubefcens, abdomine polline flavo adfperfo.

Pedes atri, rugofuli, hirti, femoribus anticis paulo craffioribus; tarfis 4-articulatis, piceis, fubtus flavo-fufcis, hirtis, pubefcentibus; *Cler. apiario* fimiles forma, breviores, latiores, articulis magis emarginatis quam in *Cler. mutillario* Fabr.

Duplo major eft *Clero mutillario*, & inter hanc & *Clerum apiarium* medium tenet; convenit cum priori habitu & colore, differt autem confpicue refpectu conditionis antennarum, palporum, tarforumque.

Patria, Nova Hollandia.
Ex Mufeo D. Francillon.

PRIONUS

PRIONUS LEPIDOPTERUS. (CERAMBIX *Linn.*)

TAB. XXI. Fig. 1.

PR. thorace subcylindrico, convexiusculo, subunidentato, subvilloso, rufo-piceo nigro-maculato; elytris subcoriaceis, abdomine brevioribus, apice dehiscentibus, truncatis, subemarginatis, humeris subgibbosis, margine laterali deflexo; lineatis subnitidis, rufo-piceis, maculis ovatis, villosis, ex flavo cinerascentibus; abdomine elongato, sphingiformi variegato.

Caput thoraci angustius, insertum, transversum, planiusculum, atrum, fronte & margine laterali pilis densis, brevibus ex flavo cinerascentibus, pubescentibus; mandibulis porrectis, simplicibus, apice mucronatis, incurvis, basi hirtis, atro-piceis, longitudine capitis.

Oculi transversi, subreniformes, marginales, fusci.

Antennæ setaceæ, atræ, elytris haud breviores.

Thorax brevis, transversus, subconvexus, subcylindricus, margine laterali in medio subunidentato; subvillosus, magis ad latera pilis brevissimis ex flavo cinerascentibus; cæterum glaber, subnitidus ex rufo-piceus, margine laterali maculisque duabus magnis, irregularibus, dorsalibus, vitta longitudinali pubescente a margine laterali distinctis, vel lateribus late, dorsoque atris.

Scutellum magnum, planum, triangulare, atrum.

Elytra subcoriacea, elongata, subcylindrica, abdomine breviora, apice angustiora & ab invicem dehiscentia, truncato-subemarginata, margine laterali deflexo, versus basin impresso, hinc humera gibbosa; margine, sutura lineisque elevatis in utroque quatuor longitudinalibus; quarum exterior subdistincta in margine deflexo, abbreviata a basi & apice remota; insequens ibi ubi margo deflectit ab humere ad apicem usque; tertia infra basin usque paulo ante apicem; quarta interna a latere scutelli, brevissima.——

Elytra

Elytra cæterum glabra, ſubnitida, rufo-picea, maculis ovatis & oblongis, majoribus, ex pilis brevibus, denſis, ex flavo cineraſcentibus, pubeſcentibus; irregulariter variegata.

Thorax & pectus ſubtus atra denſim ex cinereo pubeſcentia.

Abdomen elongatiſſimum, craſſum, teres, ſenſim verſus apicem attenuatum, paulum ad unum alterumve latus flexum, apice obtuſo acuminato; glabrum, nitidum, rufum, margine ſuperiori omnium ſegmentorum late atro, maculaque magna, tranſverſa, oblonga pubeſcente, cinereo-flaveſcente ad latus utriusque ſegmenti, ultimo excepto rufo nigroque indiſtincte variegato.

Singularis abdominis forma & pictio magnam cum Sphingibus affinitatem & ſimilitudinem refert.

Pedes breves, anteriores breviores, ultimi longiores ex rufo teſtacei, femoribus ſubpubeſcentibus, tibiis interne ſubbiſpinoſis, plantis ſubtus ſericeis.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon.

CERAMBIX GIRAFFA.

TAB. XXI. Fig. 2.

CER. obſcurus, immaculatus; thorace inermi elongato, in medio anguſtato, tranſverſim rugoſulo; elytris ſubconvexis, baſi ſcabriuſculis, apice glaberioribus, ſcutello cineraſcente, villoſo.

Caput anguſtum, cylindricum, vertice elongato, linea dorſali, media ſubdiſtincta, nitidiori, ſubimpreſſa; haud nitidum, atrum, glabrum, vage & ſparſim excavato punctatum, fronte inter antennas profunde canaliculata, mandibulis validis, incurvis, acutis, compreſſis.

Oculi atri, reniformes, ad antennarum radicem, easque ambientes.

Antennæ

Antennæ corpore duplo longiores, atræ, subscabriusculæ, articulis 5, 6, 7, 8, paulum arcuatis.

Thorax angustus, medio angustissimus, valde elongatus, una cum capite elytrorum longitudine, inermis, immarginatus, teres, antice latitudine capitis, postice paulo latior, at elytris angustior, nitidus, niger, densim transversim rugosulus.

Scutellum sat magnum, semirotundum, planum, tomentoso-cinerascens.

Elytra convexiuscula, subcylindrica, apice parum rotundato-attenuata, angulis humeralibus paulo prominulis; nitida, obscura, ex fusco-viridana, subænea, colore *Lamiæ* (Cerambici *Linn.*) *Sartori* affinia, basi usque ad medium scabra, a medio ad apicem glabra.

Corpus subtus nigrum; thorax transversim rugosulus.

Pedes unicolores, antici longissimi, longitudine totius corporis; medii multo breviores; postici brevissimi.

Femora gracilia, subcylindrica, in medio parum incrassata, mutica.

Tibiæ graciles, anticæ versus apicem dente acuto interius; mediæ & posticæ eodem loco sed exterius dente obtuso armatæ.

Tarsi quadriarticulati, articulis conicis, tertio emarginato, 4to ungulato, antici multo majores, barbati.

Aliud specimen, forte sexus alter, minus, antennis brevioribus articulis non arcuatis, thorace multo breviori, nec tam angusto, pedibus omnibus æqualibus, tarsis anticis non majoribus nec barbatis.

Differt a *Cerambice longicolli* Fabricii (*Entom. Syst. emend. t.* i. *p.* 2. *p.* 265. *n.* 52. *Olivier Ent. t.* ii. *f.* 73.) cui habitu similis; thorace rugoso, in medio angustissimo; elytris immaculatis; tibiis omnibus & diverso modo dentatis, pedibus anticis longissimis tarsis anticis barbatis, &c.

Diversa omnino hinc species esse videtur, quamvis femina minus discrepat nullo modo *C. longicolli* confundenda antennarum longitudine satis distincto.

Patria, Nova Hollandia.

Ex Museo D. Francillon, D. Marsham.

CERAM-

CERAMBIX Fichtelii.

Tab. XXI. Fig. 3.

Cer. æneus; capite latiſſimo, transverſo, tuberculo laterali villoſo ferrugineo-flaveſcente, oculum dividente; thorace anguſto cylindrico; elytris abdomine multo longioribus, valde attenuatis, apice prolongatis, divergentibus, ſubbarbatis.

Caput breve, latiſſimum, transverſum, planum, nigrum, pilis denſis, tenuibus, ſericeis, nitidis, æneis, villoſum linea media dorſali impreſſa. Tab. XIX. fig. 13.

Oculi laterales, gibbi, per tuberculum ſericeo-villoſum, ferrugineo-flavum, poſt antennas ſituatum, tali modo diviſi ut duo ad utrumque latus appareant. In omnibus quidem *Cerambicibus* Linn. *Prionis*, ſcilicet, *Lamiis*, *Saperdis*, &c. Fabr. oculi ſunt magni lunati, arcuati vel reniformes, antennarumque inſertionis tuberculum plus minus circumambientes. Singulare autem in hac ſpecie eſt, eos tuberculo proprio, magno, tali modo diviſos vel interruptos eſſe ut immo ſub lente vix ulla eorum appareat connectio. Tab. XIX. fig. 14. Oculus externus gibboſus, pars ejus poſterior ad verticem poſt antennas haud convexa, ovata.

Antennæ corpore longiores, ſetaceæ, nigreſcentes.

Frons latus, tranſverſus; labium ſuperius anguſtum, hirtum, piceum.

Mandibulæ exſertæ, apice acuminatæ, incurvæ, baſi latæ, compreſſæ; nitidæ, piceæ, ſulco laterali, lævi, hirto, exaratæ.

Thorax planiuſculus, cylindricus, muticus, immarginatus, tranſverſim rugoſulus, poſtice in medio impreſſus, nigro-æneus, lineis duabus vel quatuor, plus minus diſtinctis, dorſalibus, longitudinalibus, ſericeo-villoſo-æneis, punctiſque duobus majoribus, plus minus conſpicuis flaveſcentibus ad utrumque latus.

Scutellum

Scutellum parvum, subquadratum, planum, medio subimpressum, glabrum, nitidum, obscure æneo-nigrum.

Elytra subconvexa, basi thoraci paulo latiora, abdomine multo longiora, elongata, apice valde acuminato-attenuata, prolongata, angustissima, imo apice ab invicem divergentia & pilis nigris ciliato-barbata; glabra, subnitida, villosula, obscure ænea, sutura, a medio ad apicem, sulcoque longitudinali, a basi ad apicem elevatis.

Thorax subtus & pectus, nigra, sericeo-villosa, macula laterali distincta, ovata, villosa, lutea ad marginem pectoris posticum, aliaque subdistincta tali ad marginem anticum priori parallela.

Abdomen subtus nigro-piceum, glabrum, nitidum, macula utrinque laterali, parva, villosa, lutea, ad utriusque segmenti marginem inferiorem.

Pedes obscure ænei, villosi, femoribus omnibus paulum inflatis.

Patria, Nova Hollandia.

Ex Museo D. Francillon.

SCARITES SCHROETTERI. (CARABUS *Linn.*)

TAB. XXI. Fig. 4.

SCAR. ater; capite magno, porrecto, postice bituberoso, mandibulis magnis exsertis, basi unidentatis; thorace planiusculo, marginato, subcordato; elytris planiusculis cylindricis, marginatis, striatis; tibiis anticis palmato-subdentatis, posticis incurvatis.

Omnium longe maximus, ater, nitidus.

Caput magnum, porrectum, subquadratum, thoracis latitudine, postice angustatum in collum teres, crassum, (TAB. XIX. fig. 16. a.a.) fronte subimpressa, subrugosa (e); postice ad latera tuberosum, tuberculo utrinque sat magno, rotundo post oculos (b), sulcoque elevato,

elevato, longitudinali laterali, abbreviato, ab antennarum insertionis loco ad tuberculum usque decurrente (d).

Antennæ moniliformes, haud thoracis longitudine, articulo primo maximo, crasso, cylindrico, 3 insequentibus moniliformibus, multo minoribus, primo ex his minimo, 7 ultimis his paulo majoribus, æqualibus, compressis, marginibus villosis, hirtis ferrugineo-fuscis; cæterum atræ, lateraliter inter oculos & mandibulas insertæ. TAB. XIX. fig. 16. g. h. i.

Oculi subglobosi, laterales, fusci. TAB. XIX. fig. 16. c.

Mandibulæ magnæ, validæ, crassæ, exsertæ, porrectæ, longitudine capitis, excepto collo, arcuatæ, incurvæ, acutæ, striatæ, basi multo crassiores, interne dente valido, obtuso, exterius dilatatæ subunidentatæ. TAB. XIX. fig. 15. b—f. fig. 16. k.

Palpi sex, filiformes, inæquales; anteriores breviores, biarticulati (fig. 17. a); medii longiores, 4-articulati, articulo primo minimo (b); posteriores longissimi, 4-articulati, articulo primo crasso, minori, cylindrico rufo (fig. 18). Cæterum obtuso-acuminati, subhirti, nigri.

Maxillæ acutæ, subarcuatæ, corneæ, interne pilis ferrugineis ciliatæ. TAB. XIX. fig. 15. g.

Labium superius corneum, emarginatum.

Labium inferius majus, corneum, subtridentatum, dentibus externis multo majoribus, rotundatis, medio minimo, diviso. TAB. XIX. fig. 15. h. h. i.

Thorax a communi hujus generis structura diversus, nam subcordatus ut in familia prima Caraborum, antice elytrorum latitudine, postice angustior; planiusculus, margine laterali reflexo, antico & postico truncatis, angulis subprominulis, obtusis. Glaber, ad latera substriatus, striis transversis levibus, linea dorsali media subimpressa, aliaque laterali abbreviata, curva ad angulos posticos.

Scutellum

Scutellum mediocre, planum, ſubcordatum.

Elytra oblonga, cylindrica, non connata, convexiuſcula, profunde longitudinaliter ſtriata, ſtriis in utroque 7 ante apicem conniventibus; apice rotundata, ſubſinuata, lateribus deflexis ante marginem ſulco lato, leviter excavato, rugoſula, margine ipſo ſubreflexo.

Thorax ſubtus convexus, ſulco abbreviato impreſſo in medio.

Pectus convexum, ſulco longitudinali impreſſo in medio, ſulcoque elevato, ſubarcuato ad utrumque latus.

Abdomen breve, convexum, ſegmentis anguſtis.

Femora antica brevia, incraſſata, poſticæ thoracis parti inſerta.

Femora media paulo graciliora, pectoris baſi inſerta.

Femora poſtica dimidio fere prioribus longiora, craſſa, ſubcylindrica, valde poſtica, haud 8 lin. ante anum abdomini inſerta.

Tibiæ anticæ compreſſæ, dilatato-palmatæ, inferius ſcabræ, apice dentibus ſeu ſpinis 3 acutis, ſat longis; margine exteriori parum ſinuato, in medio paulum extenuato; margine interno excavato & hoc loco dente ſeu ſpina ſat longa, acuta, deformi, incurva, armato. Tab. XIX. fig. 19.

Tibiæ mediæ graciles, ſubcylindricæ, ſubcompreſſæ, ſcabræ, ſubſpinoſæ, apice dente ſuperius, & ſpinis duabus, acutis, inferius, armatæ.

Tibiæ poſticæ ſubcylindricæ, ſubcompreſſæ, ſubarcuato-incurvæ, ſubſpinoſæ, apicis dente interno, ſpiniſque duabus inferius.

Tarſi omnes 5-articulati, articulo 1mo & 5to longioribus, 3 mediis æqualibus, conicis.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon.

ANNOTATIO.

Genus, *Scarites*, a Fabricio Entomologisque recentioribus conſtructum, comprehendit ſpecies a Linnæo promiſcue ſub *Caraborum Tenebrionum*que nomine deſcriptas, multasque alias recenter detectas, characteribus omnino diſtinctis ſatis differentes. Differunt a *Carabis*, quibus habitu ſimillimi forte, capite thoraceque magnis, latis; mandibulis validis, porrectis dentatis; antennis moniliformibus (non filiformibus) brevioribus craſſioribus; palpis filiformibus, minime truncatis; labio dentato, non truncato; tibiis anticis dentatis, &c.

Hæc ſupra deſcripta ſpecies a communi *Scaritum* ſtructura characteribusque huic generi adſcriptis, aliquantum differt, hancque ob rationem accuratiorem dedimus deſcriptionem.

EXPLICATIO TABULARUM.

TAB. XIX.

Lucanus æneus.

Mas.

Fig. 1. Capitis cum mandibulis pagina inferior.
2. Mandibula a latere conſpecta.
3. Mandibulæ pagina inferior.
4. Maxilla.
5. Antenna.
6. Palpi.
7. Maris tibia et tarſus anterior.
8. Fœminæ tibia et tarſus anterior.

Ejusdem varietas.

9. Capitis cum mandibulis pagina inferior.

Fig. 10. Mandibula a latere conspecta.
11. Mandibulæ pagina inferior.
12. Clypeus *Scarabæi proboscidei.*

Cerambix Fichtelii.

13. Caput a fronte adspectum.
14. Oculi divisio per tuberculum.

Scarites Schroetteri.

15. Labium inferius cum mandibula maxillaque.
    a. Margo capitis inferior.
    b. Mandibula arcuata incurva.
    c. Extenuatio dentiformis exterior.
    d. Dens internus baseos validus obtusus.
    e. Apex acutus incurvus.
    f. Sulci abbreviati.
    g. Maxilla arcuata acuta interne ciliato-pilosa.
    h.h. Labium inferius corneum magnum valde emarginatum,
    i. subdentatum in medio, dente bifido.
16. Labium superius cum antenna, &c.
    a.a. Collum.
    b. Tuberculum post oculum.
    c. Oculus.
    d. Sulcus elevatus lateralis.
    e. Impressio frontalis.
    f. Labium superius emarginatum.
    g. Antennæ articulus primus cylindricus maximus.
    h. Articuli tres insequentes subæquales moniliformes.
    i. Articuli 7 ultimi compressi.
    k. Mandibula.
17. a. Palpus anterior.
    b. Palpus medius.

18. Palpus

Fig. 18. Palpus posticus.
19. Tibia et tarsus anterior.

TAB. XX.

1. Lucanus æneus.
2. Scarabæus proboscideus.
3. Scarabæus dytiscoides.
4. Cetonia Philipsii.
5. Silpha lacrymosa.
6. Clerus fasciculatus.

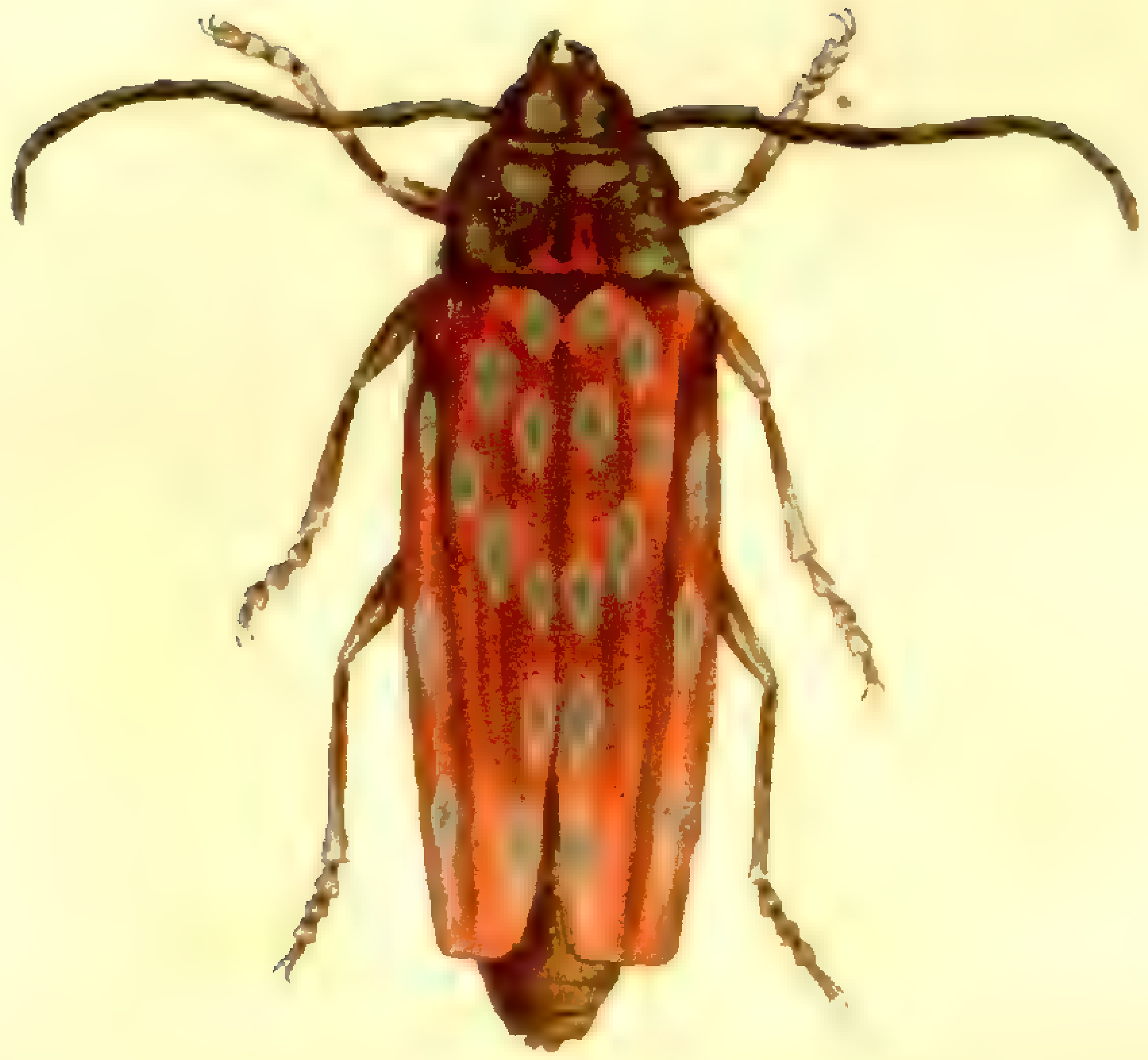
TAB. XXI.

1. Prionus lepidopterus.
2. Cerambix Giraffa.
3. Cerambix Fichtelii.
4. Scarites Schroetteri.

XVII. *De-*

5
4
3
2
1
10
9
8
7
6
13
12
11
19
18
17
16
14
15

1
2
3
4
5
6



7

8

9

10

T. Davies del. 1799.

XVII. *Defcription of Menura fuperba, a Bird of New South Wales. By Major-General Thomas Davies, F.R.S. and L.S.*

Read November 4, 1800.

MENURA.

CHAR. GEN. *Roftrum* validiufculum, convexo-conicum.
Nares ovatæ in medio roftri.
Rectrices elongatæ, pinnulis decompofitis; intermediæ 2 longiores anguftæ, exteriores ad apicem patulæ, revolutæ.
Pedes validi ambulatorii.

MENURA SUPERBA.

TAB. XXII.

THE total length of this fingular bird from the point of the bill to the end of the broad tail feathers is 43 inches; 25 of which are in the tail alone. The bill rather exceeds an inch in length, is ftrong, formed much like that of a peacock, and black, with the noftrils, which are long open flits, rather large, placed near the middle of its length. The head, which is fomewhat crefted at the hind part, neck, fhoulders, back, upper tail coverts, and upper furface of the tail feathers, of a dark brownifh black. Throat rufous, reaching fome way down the middle of the neck. Breaft, belly, and vent gray. The feathers of the latter are long, very foft, and of a filky texture. Thighs nearly of the fame colour, rather long, and feathered

6 down

down to the knee. Scapulars of a brownifh tinge. Upper tail coverts, and prime quill feathers, which are fomewhat curved at the ends, brown black. Edges of the quills gray. The legs long and very ftrong, covered with large fcales, efpecially in front. The feet, which are likewife large, and the nails, are black; the laft fomewhat crooked, convex above and flat beneath; the hind nail near three quarters of an inch long.

The tail confifts, in the whole, of fixteen feathers; all of which, except the two upper or middle ones, and the two exterior on each fide, have long flender fhafts furnifhed on each fide with delicate long filaments, four inches or more in length, placed pretty clofe towards the rump, but more diftant from each other as they approach the extremity, and refemble much thofe of the Greater Paradife Bird. The two middle or upper ones are longer than the reft, flender, narrow at the bafe, growing wider as they approach the ends, which are pointed; webbed on the inner edge all the way, and furnifhed with fome diftant hair-like threads near the end on the outer fide, of a pale gray colour beneath, and brown black above, as is the reft of the tail. The two exterior feathers on each fide are of an extraordinary conftruction, rather more than an inch wide at the bafe, and growing wider as they proceed to the ends, where they are full two inches broad and curve outwardly; the curved part is black with a narrow white border; the quills of thefe feathers are double for two thirds down from the rump. The general colour of the under fides of thefe two feathers is of a pearly hue, elegantly marked on the inner web with bright rufous coloured crefcent-fhaped fpots, which, from the extraordinary conftruction of the parts, appear wonderfully tranfparent, although at firft fight feemingly the darkeft; they are alfo elongated into flender filaments of an inch or more, efpecially towards the extremities.

The figure of the male, which accompanies this defcription, was taken

taken from a ſpecimen ſent from New South Wales as a preſent to Lady Mary Howe. I have alſo ſeen two other ſpecimens in the poſſeſſion of the Right Hon. Sir Joſeph Banks, which I believe have ſince been depoſited in the Britiſh Muſæum.

SINCE I had the honour of communicating to the Linnean Society the foregoing deſcription of the *Menura*, I have been favoured with both male and female of that extraordinary bird from my friend Governor King, by the Buffalo ſtore-ſhip; and I am thereby enabled to lay before the Society a deſcription of the different ſexes. I find, indeed, that with a little deviation the ſame characters and colours will ſerve for both of them. The female, however, is ſomewhat ſmaller, being in length, from the crown of the head to the end of the tail, only 31 inches. The general plumage of the whole bird is of a dull blackiſh colour, a little rufous under the chin and throat, and of a browniſh caſt on the ſcapulars, as in the male. The plumage of the whole body, from the breaſt to the vent, and from the ſhoulders to the rump, is compoſed of long, ſlender, thread-like, ſilky feathers, reſembling fringe, of a dull grayiſh black; lighter on the breaſt, belly, and vent. The bill and legs, which are ſtrong and furniſhed with large ſcales, as in the cock, are black. From the head to the rump 14 inches. The tail 18 inches, alſo of a dull brown black colour above and gray beneath. The two upper tail feathers are ſharp pointed at the ends; the reſt are rounded and darker in colour, and ſhorten by degrees, as they approach the rump, ſo as to appear cuneated. The two outer feathers are ſhorter than the reſt, bent in form like thoſe of the male, brown black above, of a pearly gray beneath; and the creſcents, which are

of a deeper rufous colour, are not fo vifible nor fo large, but more tranfparent if poffible, than thofe of the cock. They are about an inch and a half broad, and not black or longer at the ends as in the other fex.

From thefe birds being found in the hilly parts of the country, they are called by the inhabitants the Mountain Pheafant. With refpect to their food or manners I have not as yet obtained any particular account. In my fpecimens, there is a nakednefs round the eyes, but whether this is from the feathers having fallen off I know not. I rather think otherwife, and that it may be brightly coloured as in many other birds.

Blackheath,
19th June, 1801.

XVIII. *On*

XVIII. *On the Doryanthes, a new Genus of Plants from New Holland, next akin to the Agave.*

By Joſeph Correa de Serra, LL.D. F.R.S. and L.S.

Read December 2, 1800.

AMONGST the various new and intereſting plants with which New Holland has of late enriched Botany, none perhaps has an equal claim to public notice with the plant which forms the ſubject of the preſent paper. Its beauty, its ſhape and elegance, and the tenacity of its vital powers, entitle it to particular attention both from the cultivator and the naturaliſt.

It was found in the mountainous part of the colony of New South Wales, by Mr. George Baſs, A.L.S. who brought the firſt ſpecimens of it laſt year to Europe, in the ſhip Perſeverance. Other ſpecimens, in a high ſtate of preſervation, have ſince been brought in ſpirits by Governor Hunter. From both theſe ſources, and a ſingle flower which came to perfection at Kew, from a portion of ſtem without roots, which had been cut many months before, in New Holland, the following deſcription of the genus has been made, and the character eſtabliſhed:

DORYANTHES*.

Flos.

Calyx nullus, niſi ſpathæ partiales.

* From the Greek Δορυ, *haſta* ; Δορυανθης, *Haſta florida.*

Corolla monopetala, infundibuliformis, fexpartita; laciniæ fex, oblongo-lanceolatæ, concavæ, dorfo carinatæ, tres interiores bafi latiores.

Stamina. Filamenta fex, longitudine fere petalorum, fubulata, antherarum bafes profunde penetrantia; antheræ erectæ, fubcylindricæ, biloculares, poft fœcundationem extinctoriiformes.

Piftillum. Stylus unicus (ex tribus connatis), trifulcatus, longitudine ftaminum; ftigma trilobum.

Fructus.

Induviæ nullæ.

Pericarpium. Capfula turbinato-ovata, fubtrigona, trifulcata, veftigiis petalorum ftylique coronata, trilocularis, trivalvis; fubftantia duplex: interior lignofa, exterior corticofa, ftriata, fibrofa.

Placentatio. Chordulæ piftillares fex, per paria difpofitæ, axi differpimentorum affixæ. Semina chordulis piftillaribus alternatim affixa, ut fingula tantum feries in unoquoque loculo appareat.

Dehifcentia duplex: per axim diffepimentorum, et per valvarum futuras.

Semen Liberum.

Forma. Semen planum, reniforme, rugofum. Nucleus lateralis, fubtriqueter, dimidiam hujus partem obtinet.

Integumentum. Duplex; exterius fpongiofum; nuclei cartilagineum.

Perifpermum. Amygdalinum, nucleo conforme.

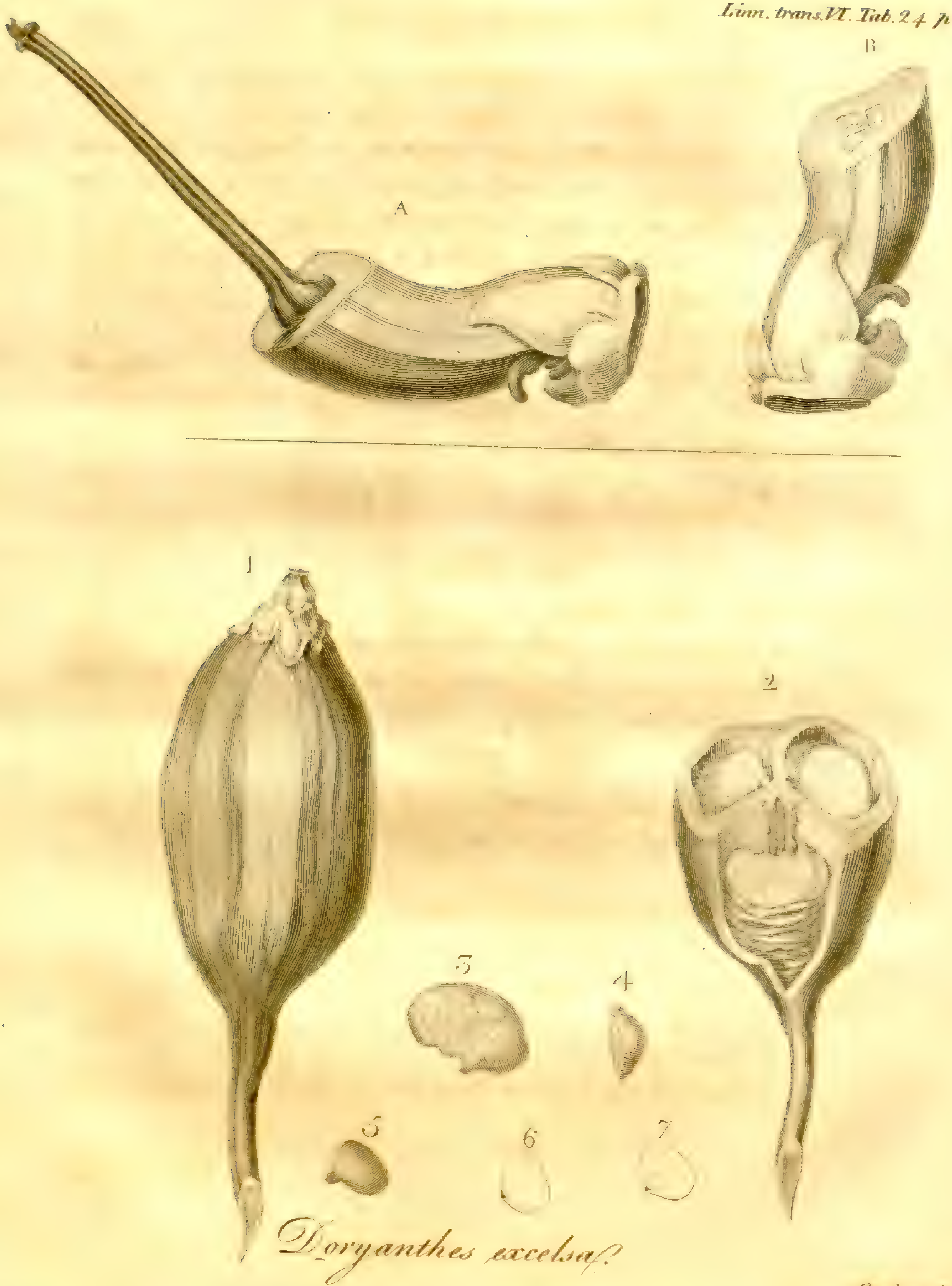
Embryo monocotyledoneus, minutus. Cotyledon foliaceo-compreffa, plana, cuneiformis.

Obfervation 1. The *Agave*, *Fourcræa*, and *Doryanthes*, have a very ftrict affinity. The antheræ, filaments, and the difpofition of feeds offer the greateft differences. The antheræ in the *Agave* are *incumbentes*, in the *Fourcræa* the filaments are alated; the corolla

hexapetala.

Doryanthes excelsa!

G Quein : Sculp.



Doryanthes excelsa.

Queiroz Sculp.

hexapetala. The feeds in the *Agave* are ranged in two feries; in the *Doryanthes* they are difpofed as above, and the antheræ as defcribed.

Obferv. 2. The veftiges of the corolla in the fruit perfuade me that the corolla is to be confidered as *fupera*, but the *traces* of the divifions of petals, which may be remarked in the flower as far as the pedunculus, might perhaps induce a fufpicion that the fruit makes one body with the inferior part of the corolla, which by that means *in fructum abit.*

The loftinefs of the ftem of the only fpecies hitherto known of this genus, which arifes to the height of above 20 feet, may warrant the trivial name of *Doryanthes excelfa.*

REFERENCES TO THE PLATES.

Tab. XXIII.

Fig. 1. The whole flower.
2. Lacinia of the corolla with a filament.
3. Anthera extinctoriiformis, as it appears after the fœcundation.

Tab. XXIV.

Fig. A. Germen and piftillum.
B. Horizontal fection of the germen.
1. Capfula.
2. Horizontal fection of the fame.
3. Seed.
4. Section of the fame.
5. Nucleus.
6. Naked feed.
7. Section of the fame to fhow the perifpermum and embryo.

XIX. *Obfer-*

XIX. *Obſervations on ſeveral Species of the Genus Apis, known by the Name of Humble-bees, and called Bombinatrices by Linnæus.*

By Mr. P. Huber, of Lauſanne in Swiſſerland.

Read May 5, 1801.

Introduction.

ON s'eſt intéreſſé de tous tems aux Abeilles; leur induſtrie a fait déſirer de connoître leurs mœurs, et de profiter de leurs travaux; mais les Bourdons, moins utiles, ont auſſi moins attiré les regards: ils ne ſont connus que par les obſervations de Mr. de Réaumur; avant lui, des naturaliſtes peu exacts avoient fait une eſpèce de roman de leur hiſtoire, mais il l'a purgée de tout le merveilleux, et il a ſçu nous intéreſſer par le ſimple récit de faits dont il a été le témoin; on trouve un précis de ſes obſervations dans la préface du ſixième volume in octavo de ſon *Hiſtoire des Inſectes.*

Mr. de Réaumur ne donne pas une deſcription aſſez détaillée de ces inſectes, et les deſcriptions de Linné et de Géoffroi ne me paroiſſent pas même ſuffiſantes pour diſtinguer les divers individus dont chaque famille de Bourdons eſt compoſée; j'ai eſſayé de les décrire, avec tous les détails propres à les faire réconnoître; j'ai même joint à mes deſcriptions des figures précieuſes dont quelques uns de mes amis ont bien voulu enrichir ce mémoire.

Mr.

Mr. de Réaumur n'avoit pas vû fur ce fujet tout ce qu'il pouvoit offrir de curieux; il avoit laiffé un vafte champ aux recherches des naturaliftes; il reftoit à obferver fi le logement et le nid des Bourdons étoient toujours tels qu'il les avoit décrits, fi ces infectes n'habitoient jamais que des nids de mouffe placés au-deffus du terrain, et fi le nombre des individus de chaque peuplade étoit limité, ou s'il ne l'étoit pas.

On pouvoit défirer plus de détails que cet obfervateur n'en a donné fur la cire qu'il a trouvé dans les nids des Bourdons, il étoit curieux de connoître la nature de cette matière, fa formation, et fes rapports avec la cire des Abeilles?

Les notions que ce célébre naturalifte nous a laiffé fur l'éducation des petits, n'étoient pas affez diftinctes et affez détaillées pour fatisfaire nôtre curiofité.

Il étoit à défirer de favoir fi les Bourdons n'avoient d'autres magazins que ce peu de refervoirs dont parle Mr. de Réaumur, et s'ils tenoient leur miel dans des vafes fermés ou dans des vafes ouverts?

Plufieurs traits curieux de l'induftrie des Bourdons avoient encore échappé à Mr. de Réaumur; foit qu'il eût d'autres occupations quand il obfervoit ces infectes, foit qu'il donnât alors trop peu d'importance à ces recherches. Mais depuis *les nouvelles obfervations fur les Abeilles*, des problèmes intéreffans devoient piquer la curiofité des naturaliftes, il étoit important de favoir fi l'on trouveroit chez les Bourdons, comme chez les Abeilles, cet attachement et ces foins des petits pour leur mère, s'ils feroient un cercle autour d'elle, et fi lorsqu'ils la perdroient ils abandonneroient leur ruche; fi l'on trouveroit quelquefois plufieurs femelles qui pondiffent dans le même nid, et fi l'on verroit parmi les ouvrières de ces mouches à demi fécondes dont tous les œufs donnent naiffance à des mâles; fuppofé que cela fût, il falloit encore favoir s'il y auroit quelque rivalité entre toutes ces mouches fécondes; enfin fi les mâles des Bourdons périffoient, comme ceux

ceux des Abeilles dans l'acte de la fécondation, & quelle pouvoit être la durée de la vie de ces infectes.

Le défir ardent de réfoudre des problèmes auffi intéreffants m'auroit feul déterminé à choifir cette branche de l'hiftoire naturelle, fi cette étude n'avoit pas eu un autre attrait pour moi; car en me familiarifant avec des infectes du genre des Abeilles, je pouvois feconder mon père dans fa recherche favorite, et remplacer auprès de lui l'homme précieux que des circonftances affligeantes lui avoient fait perdre.

C'eft dans ces vues que je commençai au mois de Juin, 1796, à étudier les mœurs des Bourdons; on jugera par ce qui fuit, de la manière dont j'ai rempli mon but, mais j'efpère qu'on aura quelque indulgence pour le travail d'un naturalifte de dix-neuf ans.

CHAPITRE I.

Déscriptions de quelques Efpèces de Bourdons.

LES Bourdons ont été rangés par les naturalifte sdans la feconde famille du genre des Abeilles, autant peut-être par la confidération de leurs mœurs et de leur induftrie, que par celle de leur conformation.

Les Caractères de ce Genre font,

Deux *antennes* brifées, dont le premier anneau eft très long.

Les *ailes* inférieures plus courtes que les ailes fupérieures.

La bouche armée d'une machoire avec une trompe membraneufe repliée en deffous, l'aiguillon fimple et en pointe.

Le ventre attaché au corcelet par un pédicule court.

Trois petits *yeux liffes*.

Le *corps* velu.

Ce qui fait placer les Bourdons dans la feconde famille des Abeilles c'eft le nombre et la longueur de leurs poils; mais ce caractère eft fi

3 peu

peu ſolide qu'il étoit important d'en trouver un qui tint à la forme du corps, et fut à l'abri de tous les inconvéniens des couleurs.

Ce caractère, je crois l'avoir trouvé dans la forme de la tête.

Les Bourdons ont la téte proportionnellement plus alongée que les Abeilles; dans celles-ci elle eſt plus large que longue, ou du moins jamais plus longue que large; et dans les Bourdons, ſa longueur ſurpaſſe toujours ſa largeur.

Je vais paſſer à la déſcription de quelques caractères qui peuvent faire diſtinguer les Bourdons de différens ſexes dans la même eſpèce.

Déſcription des Caractères individuels.

Les entomologiſtes ont décrit près de 34* eſpèces de Bourdons, ou plutôt 34 de ces inſectes; mais leurs déſcriptions ne ſont pas auſſi complettes qu'on pourroit le déſirer.

Les Bourdons femelles, mâles, et ouvrières ne ſe reſſemblent pas toujours; et comme ces naturaliſtes ne ſe ſont pas expliqués ſur le ſexe des individus qu'ils décrivoient, on peut craindre qu'ils n'aient fait des claſſes différentes toutes les fois qu'ils auront trouvé des individus qui ne ſe reſſembloient pas.

Il y avoit cependant un moyen ſûr, de laiſſer chaque individu dans ſa famille, dans ſa place naturelle; il falloit les prendre dans leurs propres nids au mois d'Août ou de Septembre. C'eſt là qu'on devoit indubitablement trouver le mâle, la femelle, et l'ouvrière de la même eſpèce: on eut bientôt appris à reconnoître le mâle de l'ouvrière, et l'ouvrière d'avec la femelle; voici les caractères généraux auxquels on pouvoit les diſtinguer.

* Caroli Linnæi Entomologia Faunæ Suecicæ Deſcriptionibus aucta; D. D. Scopoli, Geoffroy, De Geer, Fabricii, Schrank, &c. ſpeciebus vel. in Syſtemate non enumeratis vel nuperrimè detectis, vel ſpeciebus Galliæ Auſtralis locupletata, generum ſpecierumque rariorum iconibus ornata; curante et augente Carolo de Villers. Lugduni 1789.

Les Mâles et les Femelles diffèrent

1. Par leur grandeur.
2. Par l'aiguillon.
3. Par la longueur des antennes.
4. Par le nombre de leurs anneaux.
5. Par la forme de la cinquième articulation de leurs jambes poſtérieures.
6. Par celle de leurs mandibules.
7. Par la longueur de leur trompe.

Premier caractère, *la Grandeur.*

Les mâles des Bourdons ſont tous plus petits que leurs femelles: la différence eſt plus ou moins grande ſelon les eſpèces: dans quelques-unes les femelles ſont au moins le double de leurs mâles, dans quelques autres elles ne les ſurpaſſent que de quelques lignes.

La grandeur des mâles et des femelles ne varie preſque pas dans chaque eſpèce, mais les ouvrières n'ont point une grandeur auſſi conſtante: les unes ſont ſi petites qu'on ne les prendroit pas pour des Bourdons: d'autres ſont ſi grandes qu'on ſeroit tenté de les prendre plutôt pour des femelles que pour des ouvrières: cependant leur taille n'égale jamais celle des mères, et un coup d'œil ſuffit pour les comparer, et les mettre chacune dans la place qu'elles doivent occuper.

Second caractère, *l'Aiguillon.*

L'aiguillon eſt placé à l'extrémité du ventre des Bourdons et des Abeilles: il eſt long de deux ou trois lignes, et ſe meut avec beaucoup de vivacité par le moyen de huit muſcles, placés auprès de ſon origine: le dard qui paroit ſi délié à l'œil nud, eſt un petit tuyau creux, de matière de corne ou d'écaille; il contient l'aiguillon com-

poſé lui-même de deux dards accolés, qui jouent enſemble ou ſéparément; leur extrêmité eſt taillée en ſcie dont les dents ſont tournées en fer de lance.

La veſſie à venin eſt à la racine de l'aiguillon. Lorſque ces mouches ſont irritées elles font ſortir la liqueur dont elle eſt remplie, pour la darder avec l'aiguillon dans la partie qu'elles veulent bleſſer.

Les mâles n'ont pas d'aiguillon, ce qui les rend inhabiles à défendre leur peuplade; mais ce ſoin appartient aux femelles et aux ouvrières: elles font un uſage fréquent des armes qu'elles ont reçu, et ne perdent pas leur vie et leur aiguillon, comme cela arrive aux Abeilles lorſqu'elles s'en ſervent contre nous.

Leur piqueure eſt douloureuſe; elle fait élever une petite ampoule; mais le mal s'appaiſe et l'enflure diſparoit en fort peu de tems.

Si l'on enlêve le toit de mouſſe dont les Bourdons recouvrent leur nid, on entend d'abord les ouvrières et la mère battre des ailes vivement, et ce bruit aîgu eſt le ſigne de leur colère, ou de l'alarme qu'on leur cauſe; on les voit alors venir ſur leurs gateaux avec agitation, lever une patte, puis une autre du même côté, puis la troiſième, et ſe renverſer tout-à-fait ſur le dos; elles recourbent en haut leur anus, et préſentent à l'obſervateur indiſcret leur aiguillon, qui ſort accompagné d'une goutte de venin: quelquefois dans leur colère elles lancent cette liqueur, qui ne fait néanmoins aucun mal ſi elle n'eſt précédée d'une piqueure: le venin eſt cependant acide, puiſqu'il rougit les teintures bleues végétales.

Les Bourdons ſe tiennent ſur la défenſive juſqu'à ce qu'on les ait mis dans la néceſſité d'attaquer, par le dérangement de leur nid, ou par l'enlêvement de leurs petits; alors l'obſervateur doit reſter ſans mouvement auprès du nid, les Bourdons s'appaiſent, et il peut avec de l'adreſſe viſiter leurs gateaux, et même les enlever avec tous leurs habitans.

Troiſième caractère, *les Antennes.*

Les antennes des Bourdons ſont compoſées de pluſieurs articles, dont le premier eſt fort long, le ſecond très court, tous les autres coniques excepté le dernier, qui eſt de la forme de la dernière articulation du doigt annulaire; il a peut-être cette forme à cauſe de ſon uſage; il paroit bien prouvé par les obſervations de mon père, que les antennes ſont les organes du tact chez les Abeilles, et j'ai vu les Guêpes, les Fourmis et les Bourdons s'en ſervir d'une manière analogue.

Les antennes des mâles ont treize articles, elles ſont beaucoup plus longues que la tête de ces inſectes; celles des femelles et des neutres ſont plus courtes en proportion; leur longueur n'excède pas celle de la tête, et elles ne ſont compoſées que de onze articles.

Quatrième caractère, *l'Abdomen.*

L'abdomen des femelles eſt compoſé de ſix anneaux, celui des mâles de ſept.

Les anneaux de l'abdomen des mâles peuvent ſe mouvoir avec une grande liberté; c'eſt ſurtout dans l'accouplement qu'on le remarque, parce qu'alors le mâle ſe cramponne ſur le corſelet de la femelle; et comme celle-ci eſt beaucoup plus grande que lui, l'accouplement ne pourroit pas ſe faire dans cette poſture, mais le mâle alonge ſon corps de près de trois lignes, il recourbe ſon dernier anneau contre l'anus de la femelle, y fait entrer les parties qui lui ſont propres, et l'accouplement s'opère.

Dans cet acte le mâle ne perd pas les organes de la génération, et la vie même, comme cela arrive au mâle de la Reine Abeille. Quand l'accouplement a duré une demi-heure, les inſectes ſe ſéparent: le mâle eſt quelquefois ſi ardent qu'il remonte ſur ſa femelle pour s'unir encore.

Le

Le cinquième caractère est tiré de la *forme d'une des articulations des jambes postérieures des Bourdons.*

La cinquième articulation des jambes postérieures de femelles est d'une forme triangulaire, large ordinairement d'une ligne et demi à son extrêmité inférieure, et beaucoup plus étroite à l'autre extrêmité; elle est garnie tout autour de poils longs, forts, très nombreux, et tournés en dehors; elle est destinée à servir de corbeille aux Bourdons lorsqu'ils vont sur les fleurs, faire leur récolte de poussières d'étamines, ils en ont une à chacune de leurs jambes de la troisième paire; ils les garnissent de ces poussières à l'aide des pattes antérieures, et quand il les ont chargées l'une et l'autre également ils retournent à leur nid, où ces provisions sont déposées dans le magazin commun. La partie analogue dans les mâles est moins longue proportionnellement, beaucoup moins élargie à son extrêmité convexe, & entourée de poils courts foibles et peu nombreux; elle est entièrement incapable de servir aux mêmes usages, mais aussi les mâles ne sont-ils point chargés de la récolte du pollen.

Sixième caractère, *les Mandibules.*

Les Bourdons ont plutôt des mandibules que des dents; car ils ne se servent que rarement de ces instrumens pour se nourrir, mais ils les employent à d'autres usages, et leur forme nous fournira un caractère nouveau pour distinguer les mâles des femelles.

Les mandibules ou les dents des Bourdons sont ajustées aux deux côtés du chaperon à la partie latérale de la tête; elles se meuvent de droite à gauche, et de gauche à droite, mais jamais de haut en bas comme nos machoires: elles se croisent au devant de la tête, à laquelle elles donnent une forme triangulaire; elles sont quelquefois un peu repliées au dessous de la lèvre supérieure.

Celles des femelles ont une ligne de longueur; elles sont presque

en

en forme de cuillière, dentées à un bord, ſtriées, arquées, et creuſées intérieurement d'une manière très délicate.

Les mandibules des mâles ſont plates & minces, arrondies, & légèrement enfourchées à l'extrêmité, foibles et bordées ſur le dos de barbes longues nombreuſes, réunies en pluſieurs faiſſeaux, et toutes tournées du côté de l'extrêmité des dents.

Les mandibules des ouvrières ſont ſemblables à celles des femelles; les unes et les autres ſont telles qu'elles doivent être pour couper et ciſeler la cire, pour arracher la mouſſe et les brins d'herbes dont ces inſectes compoſent le toit de leurs nids. Celles des mâles ſont trop foibles, trop embaraſſées de poils, et pas aſſez tranchantes pour couper la cire, et pour ſervir aux mêmes uſages que celles des ouvrières.

Septième caractère, *la Trompe.*

La trompe des femelles eſt plus longue que celle des mâles; la partie membraneuſe ou charnue de cet inſtrument m'a paru moins velue dans les mâles que dans les femelles.

Les étuis écailleux de la trompe ſervent quelquefois à écarter les obſtacles qui ſe préſentent à la recolte du miel, comme les étamines et les piſtils de certaines fleurs; d'autrefois cet uſage ſe fait remarquer d'une manière plus frappante. Je me ſouviens d'avoir vû de fort gros Bourdons eſſayer en vain de prendre le miel contenu dans des fleurs de fêves; la groſſeur de leur tête et celle de leur corſelet les empêchoit d'entrer aſſez avant dans les longs tubes de ces fleurs; mais ces inſectes alloient droit au calice; ils le perçoient, ainſi que le tube, avec la partie écailleuſe de leur trompe; la partie membraneuſe de cet inſtrument, ou la trompe proprement dite, pénétroit alors juſqu'au ſein de la fleur, y trouvoit les nectaires, et en enlevoit le miel dont ils étoient remplis. Ces inſectes alloient ainſi de fleurs en fleurs perçant leurs tubes par dehors, et ſuçant le nectaire, tan-

dis

dis que d'autres Bourdons plus petits, ou dont les trompes étoient plus longues, entroient dans la corolle, pénétroient dans le tube, et atteignoient le miel ſans la déchirer.

Les ſemences contenues dans leur ſilique ne ſouffroient point de la bleſſure faite au calice et à la corolle de ces fleurs, et les fêves qui en provenoient ne paroiſſoient pas différentes des autres fêves.

J'ai vu des Bourdons de la même eſpèce ouvrir avec leurs dents les tubes de l'ancolie à leur baſe, & chercher de la même manière le miel dans ſes nectaires.

Je joins ici une déſcription particulière de tous les Bourdons que j'ai trouvé dans les environs de Lauſanne, et que j'ai pris dans leur nid ; ils ont tous été peints d'après nature ; je n'ai ſuivi aucun ordre dans la place que je leur ai donnée dans mes déſcriptions ; elle étoit indifférente.

CARACTERES SPECIFIQUES.

ESPECE I.*

Tab. XXV. Fig. 1—3.

La Femelle. Sa tête, ſon corſelet, & les trois premiers anneaux de ſon abdomen ſont noirs ; les trois derniers ſont écarlate ; la broſſe de ſes jambes poſtérieures eſt dorée ; ſes ailes ſont ſans couleurs ; le deſſous de ſon corps et de ſon corſelet eſt noir. Fig. 1.

Le Male diffère de la femelle par deux mouchets de poils verds, l'un au deſſus, l'autre au devant de la tête ; par une bande de poils verds qui borde le corſelet du côté de la tête, et qui paſſe le long de ſon cou juſqu'au deſſous du corſelet, où elle s'étend entre les jambes, & par une autre bande verte qui borde antérieurement l'abdomen. Le deſſous du corps, qui eſt entièrement verd ; les poils de

* Apis lapidaria *Linn.*

la

la même couleur qui bordent les premières articulations des jambes antérieures; les jambes poſtérieures bordées de poils écarlates, ſont encore autant de ſignes auquels on peut recourir pour reconnoître les mâles entre les femelles et les ouvrières; ils ſont d'un tiers plus petits que les femelles. Fig. 2.

L'OUVRIERE, ou l'individu neutre, reſſemble en petit à la femelle, mais ſes pattes poſtérieures ne ſont point dorées; la grandeur moyenne des ouvrières eſt un peu inférieure à celle des mâles. Fig. 3.

OBSERVATIONS. Ces Bourdons habitent ſous terre à une plus grande profondeur que tous les autres; ils y ſont très nombreux: ils ſe logent cependant quelquefois à la ſurface du ſol; alors leur famille eſt au plus compoſée d'une vingtaine d'individus; les femelles y naiſſent plutôt que dans les nids profonds, & les mâles ont des couleurs moins vives: ſeroit-ce une variété? Dans les uns et les autres ils naiſſent plutôt que les femelles. Ces Bourdons ſont communs dans les plains ſeches et ſur les collines.

ESPECE II.

TAB. XXV. Fig. 4—6.

LA FEMELLE. Sa tête eſt noire; ſon corſelet de la même couleur, mais verdâtre antérieurement; l'abdomen noir; les quatre derniers anneaux brun-rouges; ſon corps, ſon corſelet ſont noirs en deſſous; ſes couleurs ſont moins vives que dans l'eſpèce précédente, ſes ailes plus brunes, et ſa taille inférieure. Fig. 4.

LE MALE. Il porte une couronne de poils verds ſombres ou quelquefois gris ſur un torax noir; le premier anneau eſt gris blanc, le ſecond fauve, les cinq derniers bruns rouge; il diffère auſſi de la femelle par le deſſous de ſon corps, qui eſt couvert d'un duvet

brun;

brun ; par ſes jambes poſtérieures dorées, et par ſes ailes, qui ſont moins brunes. Fig. 5.

Neutre. L'ouvrière diffère de la femelle par une petite couronne de poils d'un verd ſombre et très foncé ſur le thorax : les trois premiers anneaux de l'abdomen ſont couleur de maron, les trois derniers à peu près comme dans la femelle ; le reſte de même. Fig. 6.

Observations. Ces Bourdons vivent ſous terre. Les peuplades de cette eſpèce que j'ai poſſédé n'étoient pas conſidérables ; les mâles y nâquirent au commencement d'Août, et les grandes femelles au commencement de Septembre.

ESPECE III.*

Tab. XXV. Fig. 7—9.

La Femelle. La tête et le corſelet ſont noirs: le corſelet porte une bande jaune antérieurement. Le premier anneau de l'abdomen eſt noir, le ſecond citron, le troiſième noir, et les trois derniers blancs ; les ailes ſont fort brunes, la broſſe eſt dorée. Fig. 7.

Le Male reſſemble parfaitement à la femelle, à l'exception de ſes pattes poſtérieures, qui ne ſont point dorées ; il eſt auſſi beaucoup plus petit. Fig. 8.

L'ouvriere. Ne diffère dela femelle que par l'infériorité de ſa taille, par le 4me anneau de ſon corps, qui eſt noir, et par ſes pattes, qui ne ſont pas dorées. Fig. 9.

Observations. Ces Bourdons ſont fort communs ſur les fleurs; ils ſont leurs nids en terre à la profondeur d'un pied ou d'un pied et demi ; la population de quelques-unes de leurs ruches peut aller à

* Apis terreſtris *Linn.*

2 ou 300 individus. Les mâles et les femelles paroiſſent dans leurs nids au mois de Juillet. Cette eſpèce de Bourdons eſt remarquable par la grandeur, la force, l'activité et la vigilance des femelles et des ouvrières. L'ouvrière repréſentée dans la figure a été choiſie parmi les plus petites, pour faire voir combien elles peuvent être petites quelquefois ; leur taille ordinaire eſt à peu près celle du mâle dépeint. Ces inſectes volent avec rapidité et avec grand bruit, à cauſe de la largeur de leurs ailes.

ESPECE IV.*

TAB. XXV. Fig. 10—12.

LA FEMELLE. La tête noire; le thorax noir, chargé d'une couronne de poils jaunes interrompue à l'origine des ailes ; l'abdomen, dont le premier anneau, eſt jaune, le ſecond et le troiſième noirs, les autres blancs, eſt d'une forme étroite alongée; la broſſe des jambes poſtérieures eſt dorée, les ailes très-brunes. Cette femelle eſt un peu moins grande que la précédente. Fig. 10.

LE MALE reſſemble à tous égards à la femelle, excepté par ſon dernier anneau, qui eſt noir, et par ſes jambes non dorées; il eſt auſſi plus petit que la femelle. Fig. 11.†

L'OUVRIERE ne diffère de la femelle que par ſes pattes nullement dorées ; elle eſt à-peu-près de la taille du mâle. Fig. 12.

OBSERVATIONS. Ces Bourdons ainſi que les précédens ornent in-

* Apis hortorum *Linn.* A. ruderata *Fab.*

† Les trois demi-anneaux inférieurs, qui répondent aux trois demi-anneaux blancs du deſſus de l'abdomen, ſont quelquefois jaunes, et les autres noirs ; il n'en eſt pas ainſi de la femelle et de l'ouvrière.

finiment

finiment les prairies par l'éclat de leurs couleurs; ils volent avec bruit, et font fort attachés à leur peuplade. Celles-ci font logées en terre; elles font moins nombreufes et moins fortes que celles du *terrestris.* Les mâles et les femelles naiffent à la fin du mois d'Août et au commencement de Septembre; ils font cependant fort rares alors dans les prairies; les individus font prefque toujours de la grandeur de ceux que j'ai fait peindre.

ESPECE V.

Tab. XXV. Fig. 13—15.

La Femelle. La tête eft ornée de touffes de poils d'un verd jaunâtre très pâle, fur le front et fur le crane; le corfelet noir porte une couronne d'un verd jaunâtre, qui s'étend au deffous des ailes et des jambes; les deux premiers anneaux de l'abdomen font d'un blond cendré: le troifième eft noir; les trois derniers font d'un roux clair, & bordés de poils jaunes. Cette femelle eft ordinairement plus petite que celles des efpèces précédentes. Fig. 13.

Le Male, plus petit que la femelle, n'en diffère que par les deux premiers anneaux de fon corps, qui font fauves. Fig. 14.

L'ouvriere diffère de la femelle en ce que les deux premiers anneaux de fon abdomen font d'un verd clair; le troifième eft noir, et bordé de poils d'un verd foncé. Elle eft a peu près de la grandeur du mâle. Fig. 15.

Observations. Le mâle eft ordinairement plus gros qu'il n'eft repréfenté dans la figure. On trouve les mâles et les femelles aux mois d'Août et de Septembre. Leurs peuplades font enterrées à une petite profondeur, et ne font pas très confidérables.

ESPECE VI.*

TAB. XXV. Fig. 16—18.

La FEMELLE. Dans cette espèce la femelle est plus petite que dans toutes les autres : elle a des poils jaunes sur le sommet de la tête, et blancs sur le front, une touffe de poils d'un jaune doré sur le thorax, et entre les jambes d'un jaune verdâtre ; le premier anneau de l'abdomen est d'un blanc jaunâtre, les autres d'un verd pâle et tirant sur le jaune ; les pattes sont couvertes de poils blanchâtres, la brosse dorée, et les ailes fort brunes. Fig. 16.

Le MALE a la tête comme la femelle; le corselet à peu près semblable, excepté qu'il est moins doré au dessus, et que les poils des bords et du dessous sont blancs; mais l'abdomen en diffère beaucoup plus ; le premier anneau est blanchâtre, le second et le troisième ont une nuance de verd ; les quatrième et cinquième brunissent un peu ; les derniers sont d'un roux légèrement doré. Fig. 17.

L'OUVRIERE a la tête et le corselet à peu près comme la femelle; les trois premiers anneaux sont couverts de poils bruns ; les trois derniers de poils d'un jaune verdâtre ; la brosset dorée. Fig. 18.

OBSERVATIONS. Ces Bourdons ont été appellés par les naturalistes *Bourdons de la mousse*; en effet, on les trouve presque toujours dans les prés, cachés sous un petit toit de mousse, qui s'élève au dessus du sol, de 5 à 6 pouces ; leur nid est cependant dans un petit creux. Leurs peuplades sont peu nombreuses; ils sont d'une humeur fort pacifique.

* Apis Muscorum *Linn.*

ESPECE VII.

La Femelle. Le corſelet eſt noir, et bordé antérieurement d'une large bande jaune pâle; les deux premiers anneaux ſont noirs, les 3me et 4me blancs, et les autres noirs.

Le Male. Son corſelet eſt noir et bordé de verd; le premier anneau de ſon corps eſt recouvert de poils noirs et verds ; le ſecond et le troiſième ſont noirs ; les quatrième et cinquième ſont verds; les ſixième et ſeptième ſont noirs bordés à l'éxtrêmité de poils rouſſâtres.

Note. Lors que je fis la déſcription de ces deux inſectes, je ne ſongeai point à la néceſſité de décrire auſſi l'ouvrière; je ne l'ai pas retrouvée depuis lors ; je ne fis pas non plus deſſiner les individus décrits, mais je n'ai pas cru devoir pour cela negliger de placer enſemble deux individus que j'ai vu accouplés, et qui ſont ſi différens qu'on ne les croiroit pas de la même famille.

ESPECE VIII.

Tab. XXV. Fig. 19—21.

La Femelle. Le corſelet de cette femelle eſt noir, bordé antérieurement d'une bande verte foncée et très diſtincte; ſon corps eſt noir; les trois derniers anneaux ſont noirs, et bordés antérieurement de poils écarlates; ſes ailes ſont noires, les jambes noires. Fig. 19.

Le Male a la tête noire; le corſelet noir, portant une petite couronne verte qui eſt très ſenſible du coté de la tête; les trois premiers anneaux de ſon corps ſont noirs, bordés antérieurement de poils

poils verds; les quatre derniers ſont couleur d'or; toutes ſes pattes ſont dorées à l'extrêmité, ſes ailes ſont beaucoup moins brunes que celles de la femelle. Fig. 20.

L'OUVRIERE reſſemble parfaitement à celle de la première eſpèce; ſes ailes ſont ſeulement un peu plus brunes; les pattes ne ſont point dorées: elle diffère de la femelle en ce qu'elle n'a point de bande verte ſur le devant du thorax. Fig. 21.

OBSERVATIONS. La femelle de cette eſpèce eſt d'une grande taille; ſes écailles ſont d'un noir très foncé; le mâle eſt le ſeul de tous les Bourdons ci-deſſus dont toutes les jambes ſoient dorées; il diffère eſſentiellement de ceux de la première et ſeconde eſpèce à cauſe des poils verds repandus ſur ſes trois premiers anneaux; ces inſectes vivent ſous terre, à la profondeur d'un pied. Les mâles et les femelles naiſſent vers le milieu de Juillet.

Je pourrois aiſément donner la déſcription d'un plus grand nombre d'eſpèces; mais mon but n'étoit que d'indiquer la manière dont il feroit à déſirer qu'on décrivit les inſectes qui comptent parmi eux des individus neutres et différens, comme quelques Abeilles, les Guêpes, les Frelons, les Fourmis et d'autres Bourdons.

J'ai cherché longtems des caractères qui puſſent diſtinguer les Bourdons entr'eux, et qui fuſſent à l'abri des inconvéniens attachés aux couleurs et aux poils; mais j'ai été forcé de recourir à ces mêmes poils, comme la ſeule partie de leur corps qui offrit quelque différence facile à ſaiſir. Des obſervations de trois années m'ont appris que les caractères tirés des poils étoient très peu ſolides; et je crois devoir avertir les naturaliſtes que les Bourdons perdent leur éclat, leur luſtre et leur couleur: et qu'ils griſonnent en vieilliſſant

comme

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
21

comme les grands animaux. Les poils des Bourdons noirs et écarlates paſſent du noir au gris, de l'écarlate au jaune ou même au blanc; & les mâles, dont les couleurs ſont ſi brillantes, les perdent en partie. Les Bourdons jaunes, blancs, et noirs deviennent quelquefois noirs et blancs par l'affoibliſſement graduel de la couleur des bandes jaunes dont ils ſont ornés.

Un plus grand écueil encore pour les naturaliſtes, c'eſt la perte des poils mêmes, qui pourroit les induire à prendre pour de nouvelles eſpèces des individus ſeulement mutilés; car l'épaiſſeur plus ou moins grande de ces poils, au travers deſquels on apperçoit d'autant mieux les écailles de l'animal qu'ils ſont plus rares, donne lieu à des nuances nouvelles, et qui m'ont quelquefois trompé, malgré les ſoins particuliers que j'ai mis à ſavoir les diſtinguer.

Ainſi, dans les Bourdons de la mouſſe, leur corps d'un jaune verdâtre devient brun au bout de quelque tems; d'autres Bourdons perdent les poils de leur corſelet, et laiſſent le diſque ſupérieur parfaitement à nud; quelquefois tous les poils de leur abdomen tombent, et l'on ne voit plus qu'un corps noir et écailleux, là où des belles bandes jaunes ſe faiſoient précédemment remarquer par leur éclat. Je conſerve dans ma collection une femelle qui n'a plus que deux mouchets de poils rouges ſur les derniers anneaux de ſon abdomen; elle eſt d'ailleurs parfaitement raſe; j'en ai vû d'autres entièrement depourvus de poils: la calvitie des Bourbons ſeroit encore bien plus importante à reconnoître, ſi la forme de leur tête ne pouvoit offrir un caractère qui les diſtingue des autres Abeilles.

Ces inſectes ſont ſujets à divers accidens; quelques-uns d'entr'eux ſont remarquables par des mouchets de poils blancs placés irrégulièrement ſur leur abdomen, au milieu de leurs poils noirs; d'autres ont ſur leur corps un mouchet de poils écarlates vraiment accidentels, car leurs petits ne participent point à ces irrégularités. On

trouve encore dans les nids des Bourdons des individus mutilés; celui-ci vient de naître, et fes ailes, au lieu de fe développer, fe tordent et fe defféchent; celui-la périt parceque fa trompe eft mal conftruite, et qu'il ne peut en faire ufage; un troifième eft forti de fes enveloppes avant l'âge prefcrit par la nature; fes membres n'ont pas acquis toute leur confiftence; quelques parties des jambes font reftées blanches ainfi que les yeux; la trompe mal développée ne peut fournir à l'infecte la nourriture dont il a befoin; il meurt.

J'ai remarqué un fait analogue chez les fourmis de plufieurs efpèces; leurs femelles naiffent ailées ainfi que leurs mâles; quelque tems après leurs amours les mâles périffent; mais les femelles fubfiftent, et toutes perdent leurs aîles très peu de jours après; qu'on fouille alors leur nid jufqu'au fond, on ne trouvera pas un infecte ailé; je ne fais pas exactement le nombre de jours au bout defquels elles font ainfi mutilées, mais je crois que ce n'eft pas plus d'un mois après l'accouplement *.

CHAPITRE II.

Des Cavités fouterraines dans lefquelles on trouve les Nids de Bourdons.

LES Bourdons font des infectes ovipares; ils pondent leurs œufs dans une cellule d'une cire particulière, qu'ils conftruifent dans une cavité fouterraine; il fort de ces œufs autant de petits vers; ils y font nourris et foignés par une mère qui veille dabord feule à leur fureté et à leur confervation; ils groffiffent de jours en jours; ils fe filent un coque de foie, ainfi que les vers des Abeilles; quelques jours leur fuffifent pour fe transformer en nymphe; ils demeurent immo-

* Ce fait a été vû par Mr. Latreille.

biles

biles jufqu'au moment où ils doivent déchirer toutes leurs enveloppes, et fe montrer fur le nid comme les autres Bourdons; alors leurs ailes fe déployent, tout leur corps eft femé de poils, qui prennent bientôt les couleurs les plus variées; ils commencent à aider leur mère dans fes travaux avec une addreffe qui ne le cède pas à la fienne.

Je ne fais point fi Mr. de Réaumur a obfervé les Bourdons qui habitent les creux fouterrains; mais il n'a pas écrit l'hiftoire de ces infectes, et l'on ne trouve rien dans fes mémoires fur la profondeur à laquelle ils fixent leur habitation, fur la forme et les dimenfions de la cavité qui doit receler leur nid, ni fur les chemins qui y conduifent; il dit feulement qu'il a vû fort fouvent des femelles de Bourdons qui travailloient avec une grande activité à creufer en terre des trous très profonds; leurs dents détachoient des brins de terre; les premières jambes s'en faififfoient, et les pouffoient au devant des fecondes; celles de la troifième paire les recevoient à leur tour, et les pouffoient en arrière auffi loin qu'il leur étoit poffible.

Il paroit que ces femelles fondoient le terrain; elles auroient probablement approfondi ces trous, et prolongé leurs galeries fouterraines fi quelque obftacle ne s'y fut oppofé; mais celles qui les avoient ébauché avec beaucoup de travail, et qui y avoient employé plufieurs heures, les abandonnoient fans les percer au delà d'un pouce ou deux, et alloient en conftruire d'autres tout auprès. Mais Mr. de Réaumur ne les vit jamais prolonger ces galeries, ni commencer aucun nid dans l'efpace que plufieurs d'entr'elles avoient creufé féparément fous fes yeux. On croiroit même qu'il n'a pas foupçonné que certains Bourdons habitoient des cavités fouterraines; fon obfervation, toute incomplette qu'elle eft, prouve que ces infectes ont été inftruits à creufer des fouterrains, et peut nous donner l'idée de la manière dont ils les excavent.

Géoffroy parle des Abeilles Bourdons dans ſon *Hiſtoire abrégée des Inſectes*; voici ce qu'on lit à la page 404 du ſecond volume de ſes œuvres:

" C'eſt ſous la terre que travaillent les Bourdons, et ſurtout ſous les gazons dont les racines liant la terre forment une voûte plus ſolide au ſouterrain que pratiquent ces inſectes. On en voit un nombre conſidérable voltiger ſur les gazons; on n'a qu'à les ſuivre, on appercevra un endroit où ils diſparoiſſent, et en regardant de près on découvrira l'ouverture de leur habitation. S'ils ne font que la commencer, tous ces inſectes ſeront occupés à fouir la terre et à tranſporter dehors les molécules qu'ils en détachent. Les trous qu'ils pratiquent ſont vaſtes et ſpacieux, auſſi beaucoup d'inſectes ſe mettent-ils à l'ouvrage, car ces Abeilles vivent en ſociété comme les Abeilles domeſtiques."

Les Bourdons que j'ai obſervé habitoient auſſi ſous terre; on trouvoit leur nid à la profondeur d'un ou deux pieds; le chemin qui y conduiſoit étoit quelquefois long et tortueux; le nid étoit dans une cavité aſſez conſidérable, d'une forme voutée, plus large que haute; elle étoit tapiſſée de feuilles dans le fond, et le gateau étoit poſé délicatement ſur un lit de cette matière.

Quelquefois les femelles de ces Bourdons qui habitent ſous terre établiſſent leur nid à la ſurface du terrain; elles le font dans un petit creux tout ouvert par deſſus; elles ſavent le couvrir avec de la mouſſe, et ſont inſtruites à le tapiſſer en dedans avec de la même matière; ce n'eſt cependant pas là leur logement naturel, car leurs familles y ſont peu nombreuſes, tandis qu'elles le ſont beaucoup plus, lorſqu'elles les fixent dans des cavités dont l'abord eſt plus difficile pour les inſectes qu'elles ont à craindre; leurs petits y ſont auſſi moins à l'abri des injures du tems, et de toute eſpèce d'accidens.

Idées

Idées ſur la Formation de la Cavité ſouterraine que les Bourdons habitent ordinairement.

L'excavation de cette cavité ſouterraine et du chemin qui y conduit, n'eſt point, comme le penſoit Géoffroy, le réſultat du travail de toute une famille de Bourdons; le nid lui-même n'eſt pas l'ouvrage d'un peuple nombreux.

Une femelle ſolitaire a choiſi et préparé ce logement au commencement du printems; elle a poſé les fondemens des gâteaux, et elle n'a pû être aidée dans ſon travail, que lorſque ſes petits ſont parvenus à l'état de perfection.

Je n'ai point vû de quelle manière elle creuſoit le chemin qui aboutit à ſon nid; je ne ſais pas mieux comment elle forme la voûte ſous laquelle elle a établi les fondemens de ſes gâteaux. On ignore même ſi elle creuſe toujours cette voûte, ou ſi elle ne profite point dans certaines occaſions de quelques trous faits par des taupes, ou par d'autres animaux; le hazard ſeul peut mettre ſous les yeux de l'obſervateur une femelle creuſant la galerie qui doit conduire à ſon nid.

Il ne ſeroit peut-être pas impoſſible d'obliger une femelle de Bourdon à travailler en terre.

On lui donneroit pour habitation un cabinet bien expoſé au ſoleil, et fermé de toutes parts.

On mettroit à ſa portée des vaſes de fleurs, où elle pourroit recueillir, comme dans un parterre, tous les ingrédiens néceſſaires à l'exécution de ſes travaux; elle trouveroit dans les vaſes une terre facile à miner; on la verroit peut-être commencer à eſcaver la galerie dont j'ai parlé: après avoir ſuivi ce travail, on ne trouveroit pas de difficulté à concevoir comment elle prépare, comment elle évide la cavité ſouterraine.

Si elle ſe refuſoit à miner la terre, on pourroit eſſayer de lui pré-

parer quelques trous ſemblables à ceux des taupes: ce ne ſeroit pas à la vérité le moyen de voir comment elle creuſe ſon logement; mais ſi elle profitoit de ces trous, on pourroit ſoupçonner que dans l'état naturel elle ſe ſert auſſi quelquefois des cavités qu'elle trouve toutes faites, et qu'elle eſt diſpenſée de la peine de les creuſer.

Quelques obſervations viendroient alors appuyer le jugement du naturaliſte.

Il ſauroit qu'on voit dès le commencement d'Avril les femelles de Bourdons errer çà et là dans les prairies, entrer dans tous les trous qu'elles apperçoivent, les uns après les autres, comme pour choiſir celui qui leur conviendra le mieux.

Elles font ce manège pendant tout le courant de ce mois; elles ſemblent alors plus inquietes de trouver des cavités ſouterraines qu'occupées à chercher du miel ſur les fleurs.

J'aurois déſiré pouvoir raconter de quelle manière les jeunes femelles poſent les fondemens de leurs gâteaux, comment elles élèvent leurs petits dans la ſolitude, et quel eſt leur genre de vie pendant le tems où elles ſont iſolées; mais ce n'eſt que du hazard, comme je l'ai dit, que l'on doit attendre l'occaſion de voir ce qui ſe paſſe alors dans un nid de Bourdons; à quel ſigne pourroit-on en effet reconnoître l'exiſtence d'une cavité ſouterraine à laquelle on n'aboutit qu'au moyen d'un canal étroit, tortueux, et plus ou moins long, lorſqu'aucun de ſes habitans ne voltige à l'entour de ſon entrée.

Je ne perds point l'eſpérance de le voir un jour; mais en attendant je me permettrai quelques conjectures qui ſont fondées ſur mes obſervations; et afin qu'on puiſſe juger de leur vraiſemblance, j'expoſerai ici ce que j'ai vû dans les nids de Bourdons, pris au mois de Juin au fond de leur cavité ſouterraine, et placés enſuite ſous des cloches de verre.

CHAPITRE

CHAPITRE III.

Déscription des Nids des Bourdons qui vivent ſous Terre.

LES Bourdons dont Monſieur de Réaumur a écrit l'hiſtoire, ne ſont pas exactement de la même eſpèce que ceux dont je me ſuis occupé. Les prémiers habitent preſque à la ſurface de la terre, et conſtruiſent leur nid avec de la mouſſe, comme cet obſervateur le décrit dans ſon mémoire. Ceux qui m'ont occupé pendant l'été dernier habitoient quelquefois à un ou deux pieds au deſſous de la ſurface du ſol; un long canal oblique ou perpendiculaire au terrain, ſervoit de galerie aux Bourdons qui revenoient au nid. Ce conduit pouvoit avoir un demi-pouce de diamêtre; il étoit cylindrique, quelquefois jonché de feuilles sèches et de menu foin; c'eſt au milieu de ces matériaux qu'on trouvoit le nid des Bourdons, recouvert d'une calotte de çire, qui s'élevoit d'abord comme un mur autour du nid, et qui s'arrondiſſoit par deſſus en ſuivant les gâteaux à la diſtance de 4 à 5 lignes. TAB. XXVI. Fig. 1.

Après avoir enlevé cette enveloppe de cire, on étoit frappé de l'apparente groſſiereté de l'ouvrage qu'elle renfermoit; c'étoient des maſſes de corps ovoïdes d'un jaune plus ou moins pâle et d'une groſſeur différente; les uns avoient 6 lignes de longueur et 4 de largeur, les autres en avoient 4 dans leur plus grande dimenſion, et $2\frac{1}{2}$ dans la plus petite; leur plus grand diamêtre étoit ordinairement vertical. Si l'on obſervoit avec plus d'attention on découvroit qu'un petit nombre de ces corps ovoïdes formoient, en ſe réuniſſant, un groupe dont toutes les parties étoient ſolidement liées enſemble; que les corps oblongs qui occupoient le milieu de ces groupes étoient plus élevés que ceux qui les entouroient, et que ceux-ci dominoient encore ceux qui formoient un troiſième rang.

On ne voyoit la plûpart du tems que le ſommet de ces corps ovoïdes,

ovoïdes, parceque leurs bafes étoient cachées dans le centre du groupe. Tab. XXVI. Fig. 2. Les dimenfions ordinaires d'un groupe étoient d'un pouce et demi dans fa hauteur et de deux dans fa largeur.

Un certain nombre de ces groupes à peu près femblables, placés les uns à côté des autres, dans un plan horizontal, et unis légèrement enfemble par de petits liens de cire, formoient un efpèce de gâteau, dont le deffus étoit convexe, et le deffous légèrement concave.

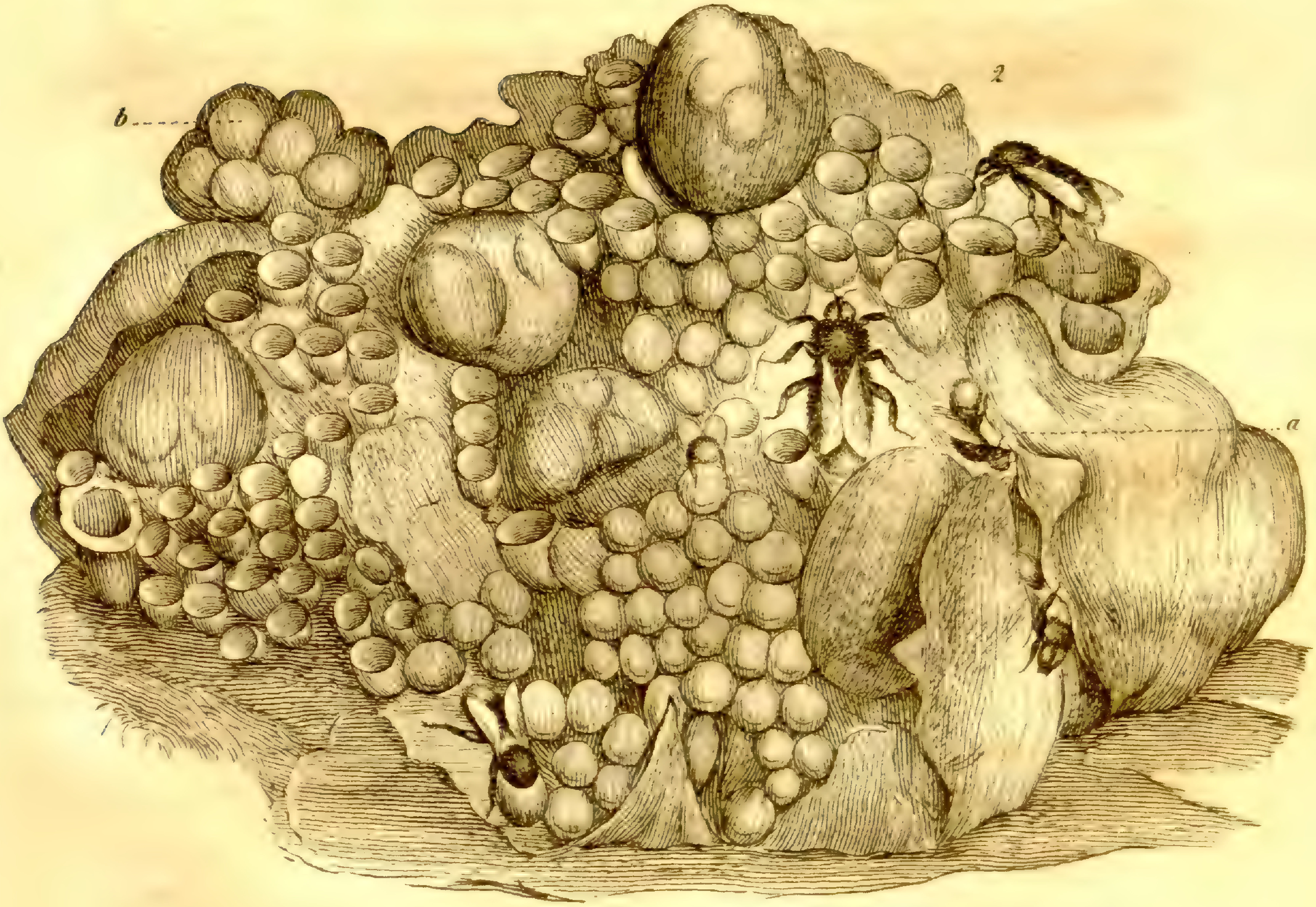
Plufieurs gâteaux de ce genre étoient pofés les uns au deffus des autres ; l'irrégularité de leurs furfaces, et les vides que laiffoient entr'eux les corps ovoïdes dont il a été parlé, permettoient aux Bourdons de les parcourir en tout tems. Chacun de ces gâteaux étoit fupporté par les fommités les plus élevées des corps oblongs de l'étage inférieur ; ils étoient outre celà liés enfemble par des pilliers de cire longs de 2 ou 3 lignes, qui alloient d'un étage à l'autre, et qui étoient moins épais dans leur milieu qu'ils ne l'étoient à leur bafe et à leur fommet.

Les corps ovoïdes qui formoient la maffe des gâteaux n'étoient autre chofe que des coques d'une foie forte et bien collée ; elles contenoient des Bourdons dans l'état de nymphe, ou des larves prêtes à fe transformer (Tab. XXVII. Fig. 1. a & b.) ; toutes les coques des gâteaux inférieurs étoient ouvertes et tronquées à leur extrêmité fupérieure, parceque les nymphes qui les avoient habitées s'étoient transformées en Bourdons, et s'étoient fait une ouverture au fommet de la coque pour jouïr de leur liberté, tandis que les coques du gâteau fupérieur étoient encore fermées, et confervoient la forme ovoïde qui leur appartenoit.

On remarquoit au deffus du gâteau fupérieur des maffifs de cire d'une forme arrondie et très irrégulière. Ces maffes de cire différoient beaucoup par leurs dimenfions ; les plus apparentes avoient un pouce et un quart de diamêtre, fur cinq ou fix lignes de hauteur ; on

Linn. Trans. VI. tab. 26 p. 238.

1



2

en voyoit de moins groſſes, les plus petites n'avoient que 3 ou 4 lignes de largeur; leur forme étoit ordinairement celle d'un ſphéroïde applati; quelquefois on trouvoit dans ces maſſifs une grande quantité de pouſſière d'étamines humectée avec du miel. On découvroit au milieu de cette pâtée un grand nombre de petits vers qui paroiſſoient s'en nourrir; car la cire qui formoit ces maſſifs n'étoit point deſtinée à leur nourriture, comme le penſoient Swammerdam et Réaumur, mais à les préſerver du froid, de l'humidité, et des accidens.

Il ne faut pas confondre ces logemens habités par pluſieurs individus, avec d'autres logemens également couverts de cire à l'extérieur, et d'une forme à peu près ſemblable, mais dont l'intérieur étoit tapiſſé d'une ſoie très délicate. Ces coques ovoïdes dont nous avons déjà parlé ne ſont habitées que par le ver qui les a filés (Tab. XXVII. fig. 1. a.): on trouvoit après cela un aſſez grand nombre de petits vaſes remplis de miel dans tous les coins, et ſurtout au milieu du gâteau.

J'ai trouvé, comme Mr. de Réaumur, trois ſortes de mouches dans ces nids; des femelles, des mâles, et des ouvrières neutres.

Les jeunes femelles ne paroiſſoient qu'à la fin de Juillet et dans le courant des mois d'Août et de Septembre; elles étoient beaucoup plus grandes que les autres mouches; leur couleur étoit quelquefois la même que celle des ouvrières, d'autres fois elles en différoient beaucoup.

On ne trouvoit qu'une femelle au printems; c'étoit la mère, comme je m'en ſuis aſſûré en la voyant pondre plus d'une fois.

Toutes les ouvrières n'étoient pas auſſi neutres que Mr. de Réaumur le croyoit, et les mâles ne travailloient point, quoique cet obſervateur l'aît prétendu; je montrerai cependant qu'ils ont plus d'une utilité pour la choſe commune.

J'ai obſervé pluſieurs eſpèces de Bourdons; leurs mœurs ne différoient

féroient pas eſſentiellement ; j'ai même ſuivi ceux qui faiſoient des toits de mouſſe au-deſſus de leur nid ; ils ne ſe conduiſoient pas différemment dans l'intérieur de leur habitation que les Bourdons qui vivoient à une plus grande profondeur.

Après avoir donné une idée générale des nids de Bourdons, j'eſſayerai de décrire les particularités les plus importantes de leur hiſtoire ; et comme c'eſt dans des cellules d'une cire particulière que naiſſent les Bourdons, je parlerai dabord de la matière dont elles ſont compoſées.

CHAPITRE IV.

De la Cire des Bourdons.

MONSIEUR DE REAUMUR parle de la cire des Bourdons qui habitent à la ſurface de la terre, lors qu'il décrit les toits de mouſſe dont leurs nids ſont recouverts ; il dit que les Bourdons mettent un enduit de cette matière ſur toute la ſurface de l'intérieur de ces toits ; qu'ils y font dabord un eſpèce de plafond, de cire brute, et qu'ils en recouvrent enſuite toutes les parois ; il ajoute que la couche de cette matière n'a environ qu'une épaiſſeur double de celle d'une feuille de papier, qu'elle eſt impénétrable à l'eau, et qu'elle contribue à la ſolidité de l'édifice, en liant enſemble les brins de mouſſe dont le toit eſt compoſé.

Monſieur de Réaumur, occupé de l'hiſtoire générale des inſectes, n'a donné aux Bourdons qu'une attention partagée ; auſſi ce grand naturaliſte nous a-t-il laiſſé bien des queſtions à réſoudre, et des points à éclaircir ; je me trouverai heureux ſi l'on veut bien regarder mes obſervations comme un ſupplément à ſon travail.

La cire des Bourdons eſt la première pierre de l'édifice; elle eſt le berçeau de toute la peuplade, le ciment de tous les gâteaux, la ſeule matière que ces inſectes puiſſent pétrir, la ſeule enfin qu'ils ſachent manier.

Cette matière dont ils ſavent faire un toit pour garantir leur nid des eaux qui pourroient filtrer au travers de la terre, et dont ils font des vaſes propres à retenir leur miel, n'eſt cependant point ſi délicate, ſi blanche, ſi ferme et ſi fuſible, que celle des Abeilles; elle n'eſt point propre à des travaux auſſi délicats.

Il ne s'agit point de conſtruire un double rang de cellules héxagones, à fonds pyramidaux; il ne s'agit point de donner certaines méſures aux logemens des individus de ſexes différens, comme chez les Mouches à miel; tous les travaux devoient être plus ſimples chez les Bourdons.

Il falloit élever une famille plus ou moins nombreuſe d'inſectes, aſſez ſemblables aux Abeilles; leurs goûts, leurs beſoins, étoient les mêmes; la nature a cependant voulu qu'ils parvinſſent aux mêmes fins par des moyens différens.

Si chez les Bourdons le nombre des ouvrières eſt plus petit qu'il ne l'eſt chez les Abeilles communes, ſi les matériaux qu'ils employent ſont plus groſſiers, et leurs ouvrages moins délicats; l'on pourra cependant remarquer, que tout eſt en proportion chez les inſectes qui nous ſemblent moins parfaits, et que le bien être de la peuplade réſulte conſtamment de l'ordre et de l'accord de toutes les parties.

Monſieur de Réaumur ne nous donne aucune idée exacte ſur la nature et ſur l'origine de la cire; il paroit même, en pluſieurs endroits, la confondre avec la pouſſière des étamines; ſa couleur, ſa conſiſtance, ſes propriétés, en diffèrent cependant d'une manière ſenſible.

La cire des Bourdons que j'ai obſervé étoit brune, molle; et le pollen que ces inſectes conſervent dans leurs magazins eſt ordinairement jaune, friable, et ſe réduit en poudre ſous les doigts. On verra par l'analyſe que je joins ici, que ces matières diffèrent encore à bien d'autres égards. Mr. de Réaumur croyoit ſans fondement, que le pollen étoit une eſpèce de cire *brute*, que les Abeilles ſavoient convertir en véritable cire; il avoit donné à la matière molle dont les Bourdons ſe ſervent dans leurs nids, le nom de cire; et jugeant par analogie, il lui avoit attribué la même origine. Il me ſembla qu'on ne pouvoit adopter un tel ſentiment, ſans un examen plus approfondi; c'eſt ce qui m'engagea à faire quelques recherches ſur l'origine de la cire des Bourdons.

Le pollen ſe convertiſſoit-il en cire dans l'eſtomac des Bourdons? C'eſt une queſtion qui étoit facile à réſoudre. Je ſavois que les Bourdons pouvoient ſe nourrir pendant quelque tems avec le pollen qu'on trouve dans leurs magazins. J'imaginai de les ſevrer de miel; de leur donner autant de pollen que je pourrois m'en procurer; de les enfermer, et de leur donner un gâteau compoſé de quelques coques, qui ne continſſent pas de cire. Ce plan fut exécuté; les Bourdons n'en firent point de cire pendant tout le tems qu'ils ne furent nourris que de pollen. Je crus pouvoir conclure de là, que le pollen ne leur avoit ſervi que de nourriture dans cette circonſtance, et qu'il n'avoit pas été converti en cire dans leur eſtomac.

L'expérience ſuivante, l'inverſe de la première, me prouva bien plus clairement encore, que la cire n'étoit pas du pollen préparé; elle prouve même que le pollen n'entroit pour rien dans la compoſition de cette matière; et que, par conſéquent, Mr. de Réaumur avoit ſuppoſé à la cire des Bourdons une origine qui ne lui convenoit point.

J'enfermai d'autres Bourdons ſous une cloche de verre; je leur

donnai

donnai auffi un petit gâteau de coques dégarnies de cire; je les fevrai de pollen, et je les nourris de miel.

J'obfervai dès le fecond jour, que les coques avoient changé de couleur depuis la clôture des Bourdons.

Ces loges de foie, ordinairement d'un jaune clair, étoient devenues brunes au fommet, luifantes et gluantes; le lendemain je fus étonné de voir que la matière colorante avoit été enlevée de deffus les coques de cire; et qu'elles étoient jaunes comme auparavant; mais le furlendemain je fçus ce qu'elle étoit devenue,—je vis que les Bourdons en avoient fait un pot à miel fur le bord du gâteau.

Je trouvai le jour fuivant, que la femelle avoit conftruit une cellule de cire neuve fur l'une des coques, et qu'elle y avoit dépofé des œufs.

La matière dont elle avoit été conftruite étoit parfaitement femblable à la cire ordinaire des Bourdons, excepté qu'elle étoit plus luifante, propriété qui tenoit peut-être à ce qu'elle avoit été produite depuis peu: cette expérience m'apprit non feulement que le pollen n'entroit pas dans la compofition de la cire, mais elle me découvrit que le miel étoit la matière première de cette fubftance, et qu'il fe convertiffoit en cire par l'effet d'une élaboration particulière.

Mais étoit-ce la partie fucrée du miel, ou quelqu'autre principe, qui avoit produit dans le corps des Bourdons cette cire que je trouvai fur leurs gâteaux?

Il falloit une expérience directe pour le décider; je commençai par repéter la précédente, et j'obtins le même réfultat.

J'imaginai de nourrir ces mêmes Bourdons avec du fucré humecté; je leur donnai un autre gâteau qui ne contenoit aucune parcelle de cire.

Je les tins enfermés fous une cloche de verre. Au bout de vingt-quatre heures je vis diftinctement le deffus du gâteau teint en brun; je ramaffai avec la lame d'un canif la matière colorante; j'y reconnus

 bientôt

bientôt la cire comme la première fois; cette ſubſtance expoſée au feu ſur une lame de verre ſe fondoit, et couloit un peu; elle bouillit bientôt après, et laiſſa échapper une odeur déſagréable.

Je conclus de cette dernière expérience, que la partie ſucrée du miel ſuffiſoit pour mettre les Bourdons en état de produire de la cire.

Je n'avois pas encore vu de quelle manière les Bourdons produiſoient cette cire; je penſai dabord qu'elle ſortoit par leur bouche, et que les Bourdons enduiſoient de cire, ou peignoient les gâteaux, en ſe ſervant de leur langue comme d'un pinceau; mais avant de me laiſſer perſuader par une ſimple conjecture, je cherchai à m'inſtruire de la vérité par de nouvelles obſervations.

Je penſai que ces Bourdons feroient vraiſemblablement de la cire, lors même que je ne leur donnerois point de gâteau.

Je plaçai une table devant ma fenêtre, à fin de voir au grand jour les moindres détails; je mis une feuille de papier parfaitement blanc ſur cette table; je la couvris avec un récipient de verre, et j'en fermai ſous la cloche un certain nombre de Bourdons d'une autre eſpèce; je les nourris avec du miel, que je leur donnai ſur une carte, et je les obſervai.

Les Bourdons ſe rangèrent en cercle autour de leur mangeoire; ils déployèrent leur trompe, et prirent avec cet inſtrument tout le miel que je leur avois donné.

Ils mangèrent pendant près de 10 ou 15 minutes; j'en vis alors quelques-uns ſe mettre un peu ſur le côté, broſſer leur ventre avec les pattes de la ſeconde paire, ſe frotter de même à l'endroit où les demi-anneaux ſe rencontrent ſur les côtés de leurs corps, et ſe redreſſer enſuite: ils faiſoient alors paſſer tour-à-tour les deux jambes qui venoient de broſſer leur ventre entre les deux jambes de derrière, qui ſe rapprochoient l'une de l'autre; et tandis que celles-ci ſerroient l'une de celles de la ſeconde paire, le Bourdon faiſoit effort

pour la retirer de l'efpèce de pince dans laquelle il l'avoit engagée; par cette manœuvre bien fimple les jambes de la troifième paire enlevoient à celles de la feconde toute la matière qu'elles avoient prife fur les anneaux. Tab. XXVII. Fig. 2.

Mais quand les jambes de la troifième paire étoient affez chargées de cette matière, il falloit auffi qu'elles s'en dépouillaffent, et c'étoit par un autre moyen.

Les Bourdons y parvenoient en les frottant du haut en bas affez rapidement: quand la matière étoit arrivée à leur extrêmité, ils la pouffoient fur le parquet. Ces Bourdons répétoient deux fois cette manœuvre pour chacune des jambes broffantes.

Dans cette opération on a vû les Bourdons frotter leur ventre avec les jambes de la feconde paire, puis les faire paffer fucceffivement deux fois entre celles de la troifième, qui finiffoient par dépofer fur le parquet la matière dont elles avoient été chargées.

D'autres fois ils frottoient leur ventre avec les jambes de la troifième paire, et les faifoient paffer entre celles de la feconde; cette opération l'inverfe de la précédente avoit le même réfultat, et les jambes de la feconde paire fe dépouilloient enfuite, de la même manière, de tout ce qu'elles avoient pris à celles de la troifième. Tab. XXVII. Fig. 3.

Tous ces Bourdons firent plufieurs fois la même manœuvre; et quand j'en eus découvert le but, j'examinai avec beaucoup d'attention la matière que leurs jambes laiffoient après elles fur le papier.

C'étoit ordinairement des points noirs ou bruns, prefque liquides, mais qu'on ne pouvoit examiner que lorfqu'il y en avoit un certain nombre; alors, en les réuniffant fur la lame d'un couteau, on y reconnoiffoit la même matière que celle dont les Bourdons fe fervent pour faire des pots à miel; elle fe fondoit ainfi que leur cire ordinaire, et répandoit la même odeur quand elle étoit expofée au feu. Ils en faifoient tous les jours une quantité affez confidérable; mais

elle

elle étoit bien petite, ſi on la comparoit à la doſe de miel qu'ils conſommoient; ils pouvoient en couvrir la moitié d'une carte en un jour; la couche étoit dabord très mince, mais elle devenoit graduellement plus épaiſſe: ils me prouvèrent enfin, que c'étoit leur véritable cire eu en conſtruiſant des pots à miel ſous mes yeux.

L'apparition preſque inſtantanée de la cire ſur les anneaux des Bourdons qui venoient de manger du miel, étoit un fait très remarquable; il m'importoit de le conſtater; je crus dabord néceſſaire d'écarter une objection qui ſe préſenta à mon eſprit; on auroit pû croire que la matière cireuſe n'avoit pas été produite inſtantanément dans le corps des Bourdons que j'avois enfermés; et qu'elle avoit été élaborée par ces inſectes, avant l'inſtant de leur clôture, par l'effet de la nourriture qu'ils avoient pû choiſir. Il y avoit un moyen bien ſimple de vérifier ou de détruire cette conjecture; il ne s'agiſſoit que d'enfermer un grand nombre de Bourdons, et de leur donner du pollen, qui ne pouvoit que les nourrir ſans les mettre en état de produire de la cire.

S'ils avoient fait de la cire dans leur priſon, il auroit été prouvé que l'élaboration de cette matière avoit été faite avant la clôture; ſi, au contraire, ils n'avoient point fait de cire, la ſuppoſition d'une élaboration antérieure à la clôture auroit été détruite; j'aurois alors donné du miel à ces mêmes Bourdons toujours priſonniers, et j'aurois obſervé ce qui ſe ſeroit paſſé avec l'attention la plus ſcrupuleuſe.

Ce fut le 20 Juillet que je fis cette expérience; les Bourdons que j'avois ſequeſtrés et reduits au pollen pour toute nourriture, ne firent point de cire; un ſeul de ces inſectes broſſa une fois les côtés de ſon ventre, mais ſes jambes ne déposèrent rien ſur le parquet de ſa priſon. Quand je me fus bien aſſuré qu'ils ne pouvoient faire de la cire, je leur donnai une abondante ration de miel; je vis alors la mère et les ouvrières broſſer leur ventre, et dépoſer ſur le parquet la matière qui avoit ſuinté au travers de leurs anneaux: le réſultat

de cette expérience écartoit le doute que j'avois élevé, et il me parut démontré que la matière cireuſe n'étoit pas dans le corps des Bourdons avant qu'ils euſſent mangé du miel, et que ſa production inſtantanée étoit l'effet de cette nourriture.

Cette vérité fut pleinement confirmée dans la ſuite par pluſieurs obſervations.

L'une des plus remarquables fut, que des Bourdons, nourris quinze jours avec du miel ſeulement, firent aſſez de cire dans leur priſon pour pouvoir en conſtruire deux pots à miel, ſous mes yeux.

Une autre obſervation qui vient à l'appui de tout ce que j'ai avancé juſqu'à préſent ſur la cire, mérite auſſi quelque place dans ce chapitre.

J'avois enfermé une douzaine de Bourdons ſous une cloche de verre; je leur avois donné une portion de gâteau dépouillée de cire autant qu'il avoit été poſſible, et j'avois réſolu de les nourrir de miel pendant quelques jours, pour confirmer une des expériences précédentes.

Leur gâteau étoit compoſé d'une dixaine de coques de ſoie; ces loges qui contenoient des nymphes étoient tellement inégales, que le gâteau n'avoit aucune aſſiette; ſa mobilité inquiétoit extrêmement les Bourdons: s'ils avoient eu de la cire, ils n'auroient pas manqué de l'aſſujettir; ils ne pouvoient monter ſur le gâteau ſans le faire pencher, et ſans le mettre en mouvement: cependant leur habitude, ou plutôt leur affection pour les nymphes que contenoient ces coques, exigeoit qu'ils ſe tinſſent ſur le gâteau pour rechauffer les petits: ils inventèrent un expédient ſi ingénieux, pour ſolidifier ce gâteau, que je ne puis réſiſter à l'envie de le raconter.

Ils ſuppléèrent au défaut de la cire, en ſoutenant le gâteau *à force de bras*, comme on le voit dans la TAB. XXVII. Fig. 5.

Quand

Quand ils appercevoient par le balancement du gâteau qu'il alloit pencher de leur côté, ils deſcendoient un peu ſur ſes bords, et ſe tenoient ſuſpendus par les jambes de derrière au haut des coques, tandis qu'ils étendoient en embas les jambes de la ſeconde paire, qui ſont très longues, comme on le voit (Tab. XXVII. Fig. 4.). Ils attendoient dans cette attitude, que le mouvement du gâteau leur fit atteindre la table. Alors ils s'y cramponnoient avec les crochets de leurs pieds, comme dans la figure 5, et reſtoient dans cette poſture juſqu'à ce qu'ils fuſſent fatigués. D'autres Bourdons venoient alors les relever; pluſieurs à la fois retenoient ainſi le gâteau en ſituation; la mère elle-même les aidoit dans ce travail extraordinaire: ce manège dura deux ou trois jours; je le fis remarquer à pluſieurs perſonnes, qui le virent ainſi que moi, et qui n'en furent pas moins frappés.

Cependant le miel que je leur avois donné les avoit mis en état de produire de la cire; au bout de deux jours les coques étoient entièrement couvertes de matière brune et cireuſe. Le troiſième jour les Bourdons ne ſoutenoient preſque plus leur gâteau; ils avoient conſtruits des pilliers de cire, qui partoient de la table, pour aller ſoutenir celles des coques, dont la baſe étoit plus éloignée du plan; ce qui les diſpenſoit du travail extraordinaire que j'avois admiré les jours précédens.

Ces pilliers ne durèrent pas longtems; ils finirent par ſe rompre: leur cire s'étoit ſéchée, et n'adhéroit plus avec la même force au plan. Les Bourdons eurent recours au même expédient, pour arrêter le mouvement de leur gâteau; ils recommencèrent à le ſoutenir avec leurs jambes; j'eus alors pitié d'eux, et je colai leur gâteau ſur la table où il étoit poſé.

J'obſervai dans toutes ces expériences que la mère produiſoit beaucoup plus de cire que les ſimples ouvrières.

Je

Je vis dans d'autres occaſions des mâles que j'avois enfermé ſéparément, et nourris de miel, ſe broſſer les côtés comme les ouvrières; mais je ne pus examiner la matière qu'ils laiſſoient ſur le parquet; ce ſera le ſujet de nouvelles obſervations.

En réuniſſant mes obſervations ſur la cire je trouve,

1. Que la cire et le pollen ſont deux matières eſſentiellement différentes.

2. Que le pollen n'eſt point la matière première de la cire.

3. Que des Bourdons nourris de miel ſeulement font de la cire.

4. Que c'eſt la partie ſucrée du miel qui produit la cire dans le corps de ces inſectes.

5. Que cette cire ſort de leur corps en très petite quantité à la fois, et par les vides que laiſſent entr'eux les anneaux écailleux dont le corps de ces inſectes eſt garni deſſus et deſſous.

6. Que leur cire ſort de leur corps un inſtant après qu'ils ont mangé du miel.

7. Que les femelles font une plus grande quantité de cire que les autres individus.

8. Que les mâles paroiſſent en faire ainſi que les ouvrières, et que les femelles; mais on verra dans le chapitre ſuivant que les ouvrières et les femelles ſeulement ont été inſtruites à l'employer à différens uſages.

CHAPITRE V.

De la Manière dont les Bourdons employent la Cire dans leurs Conſtructions.

VENONS tout de ſuite au principal uſage de la cire; voyons comment on prépare au ver du Bourdon le logement et la nourriture.

ture. Je fuppoferai dabord un nid femblable à celui que j'ai décrit dans le chapitre troifième; tel qu'on le trouvera au mois de Juin, peuplé d'un nombre de mouches affez confidérable, et pourvu d'une mère bien feconde; je fortirai le nid de la terre; je le mettrai au grand jour fur ma fenêtre; je le couvrirai d'un récipient, ou d'une cloche de verre; je laifferai aux Bourdons la liberté de fortir, au moyen d'une porte pratiquée dans la planche fur laquelle j'aurai pofé leur nid; à la faveur de tous ces préparatifs je pourrai obferver et décrire ce que j'aurai vû.

Mais le nid proprement dit eft encore caché à mes yeux par une calotte de cire, qui s'élève tout autour des gâteaux, et qui vient fe former en voûte au deffus d'eux.

Rien n'eft plus facile que d'enlever cette calotte, mais les Bourdons la reconftruifent en peu de tems; ce n'eft cependant point un inconvénient, parceque la douceur de ces infectes permet toujours de la détruire.

Au deffous de cette voûte on voit déjà deux rangs de gâteaux compofés de coques oblongues, de maffifs de cire de différentes formes, et de plufieurs pots à miel.

Le nid ne contient point encore de mâles ni de jeunes femelles; on ne trouve fur les gâteaux que des ouvrières, et la femelle qui leur a donné le jour. On voit fouvent cette mère, fort agitée, courir çà et là fur le nid, s'arrêter fur un maffif de cire, ou fur un de ces pots à miel dont j'ai parlé, enlever avec fes dents quelques parties de cire fur fon bord, puis fe remettre à courir; s'arrêter au point de réunion de trois coques, y dépofer le brin de cire qu'elle apportoit, et réitérer ce manège jufqu'à ce qu'elle ait élevé un petit tas, auquel elle puiffe donner une certaine forme.

Elle ronge alors cette maffe de cire dans le milieu; elle fait paffer dans fa machoire les parcelles de matière qu'elle en retire; et les pofant fur le bord du creux, elle les pêtrit avec fes dents, ainfi que celles

celles qu'elle y avoit laiſſées; elle amincit les bords de la petite cavité, et en l'approfondiſſant d'avantage elle donne plus de hauteur à ſes parois; elle recule un peu, et travaille la matière qu'elle trouve ſous ſa machoire; elle recule encore; mais en tournant autour de ſa cellule, car ſa tête n'en quitte preſque jamais le bord, elle tourne ainſi à reculon juſqu'à ce qu'elle ait fait le tour du petit creux, qui prend déjà la forme du calice d'un gland. Cela fait, elle retourne chercher de la cire, qu'elle vient poſer ſur le bord de la cellule; elle en apporte aſſez en deux ou trois fois pour élever ſes bords de trois ou quatre lignes.

On voit ſouvent les ouvrières l'aider dans ce travail, d'autres fois le faire en entier; tantôt elles font pluſieurs de ces cellules les unes à côté des autres; tantôt elles defont la parois qui les ſépare pour n'en faire qu'une ſeule, plus large que les autres.

Mais dès que la cellule eſt achevée la mère vient lui donner la dernière perfection; elle en polit l'intérieur, en arrondit les contours, en épaiſſit les parois et en relève les bords.

C'eſt là qu'elle doit dépoſer ſes œufs; c'eſt là que ſes petits paſſeront une partie de leur vie, qu'ils ſeront nourris juſqu'à ce qu'ils ſoient en état de voler. Mais après leur avoir conſtruit une demeure aſſez ſpacieuſe pour les premiers jours de leur vie, elle ſemble ſonger auſſi à leurs premiers beſoins; elle pourvoit d'avance à leur nourriture; elle va chercher du pollen dans ces pots, où les Bourdons conſervent quelquefois des pouſſières d'étamines, et qui ſont ordinairement deſtinés à contenir leur miel. Elle revient et dépoſe dans le fond de la cellule une épaiſſe couche de pollen, mais elle l'étend de manière à laiſſer pour ſes œufs le plus grand eſpace poſſible.

Tandis que la femelle prépare un logement et des vivres pour ſes petits, les ouvrières ſont occupées à divers travaux qui méritent d'être connus. Un certain nombre d'entr'elles conſtruiſent la voûte de cire qui recouvre les gâteaux; c'eſt ordinairement à la baſe

des coques antérieures qu'elles fixent l'origine de cette enveloppe; elles la commencent d'abord d'un feul côté; elles attachent pour cela quelques parcelles de cire à plufieurs coques contigues; elles en apportent d'autres qu'elles placent entre les premières, ce qui forme une ligne plus ou moins courbe; cette ligne, fort étroite, eft la bafe de leur premier travail: elles vont enfuite chercher de la cire dans leur nid; et lorfqu'elles reviennent, on voit à leur bouche un petit morceau de cette matière, qu'elles pofent et qu'elles arrangent avec leurs dents fur les premiers brins. Leur nombre augmente, et l'on voit bientôt s'élever un mur de cire plus haut dans fon milieu qu'à fes extrêmités, et dont l'épaiffeur n'excède pas un huitième de ligne: cependant le nombre des travailleufes eft affez grand pour que l'ouvrage avance à vue d'œil, le mur s'élève déjà au deffus des coques, d'autres ouvrières en conftruifent de femblables de tous les côtés à la fois. Ils ont leurs bafes fixées fur le fond du nid fur les feuilles, ou même fur le terrain; ces murs font attachés aux coques des gâteaux, qui leur donnent toute la folidité dont cet ouvrage eft fufceptible.

Tous ces murs font bientôt joints enfemble par d'autres murs femblables, et conftruits de l'un à l'autre; on voit déjà un cintre irrégulier d'un pouce de hauteur ou d'un pouce et demi autour des gâteaux.

Jufqu'ici le travail des Bourdons avoit été vertical; leurs jambes antérieures et leur tête pofée fur le bord de l'enveloppe étoient occupées à augmenter fa hauteur, tandis que les pattes poftérieures étoient fixées fur les coques les plus voifines; on voyoit leurs antennes placées aux deux côtés du bord de la petite muraille, comme pour diriger le travail des dents; celles-ci placées de la même manière en arrière des antennes paîtriffoient la nouvelle cire qu'elles venoient d'apporter, et qu'elles mêloient avec la vieille: leur tête faifoit un petit mouvement en avant; les dents dépofoient alors une

petite

petite bande de cire ſur le bord de cette enveloppe, et donnoit au tout une épaiſſeur parfaitement égale.

Les pattes antérieures ſervoient, pour ainſi dire, de bras à ces inſectes; c'eſt avec ces membres qu'ils tenoient en ſituation le bord de cire qu'ils travailloient; leurs jambes de la ſeconde paire ſervoient à les ſupporter; ils les cramponnoient dans la cire, et cette attitude ſembloit faciliter leurs diverſes manœuvres.

A cette époque le travail devient horizontal; les Bourdons, au lieu d'ajouter de nouvelles bandes au deſſus du bord de leur muraille, les entent un peu de côté, comme font les maſſons lorſqu'ils commencent à conſtruire le cintre d'une voûte; bientôt ils quittent entièrement le travail vertical, et font au deſſus du nid un toit plus ou moins horizontal; on les voit ſouvent alors à califourchon ſur le bord de la voûte à laquelle ils ſe cramponnent et ſe ſuſpendent au moyen des crochets dont leurs pieds ſont munis.

Ils ſont repréſentés dans cette attitude Tab. XXVI. Fig. 2.

Les Bourdons travaillent alors de côté, mais c'eſt avec la même dextérité que lorſqu'ils élèvent le mur qui eſt la baſe de leur voûte; elle s'étend en tout ſens avec une grande rapidité, et bientôt elle eſt entièrement formée, tous les bords ont été joints enſemble, et les Bourdons n'ont laiſſé que quelques ouvertures fort irrègulières, deſtinées à leur ſervir de paſſage. Ces inſectes ſont véritablement alors ſous une tente d'une toile de cire; elle eſt ſoutenue en pluſieurs endroits par de petits pilliers de forme irrégulière, qui partent de deſſus les coques, et qui arrivent à la ſurface inférieure de la voûte.

Un pouce quarré de cette toile de cire pêſe à peu près quatre grains; les plus grandes enveloppes que j'ai vû avoient ordinairement quatre pouces quarrés, et peſoient par conſéquent environ 64 grains.

J'enlevai un jour l'enveloppe d'un nid de Bourdons rouges et noirs, très peuplé, et au bout de deux jours ils en eurent conſtruit une nouvelle qui peſoit 55 grains, elle pouvoit avoir 3 pouces $\frac{7}{10}$ quarrés de

de ſurface: j'enlevai encore pluſieurs fois leur enveloppe ſans les décourager; ils en firent quatre en neuf jours; je les peſais, et leur poids réuni montoit à 272 grains, ce qui équivaut à celui d'une toile de cette matière qui auroit huit pouces quarrés de ſurface; ils en firent une nouvelle en 4 à 5 jours, qui peſa 93 grains.

Les Bourdons dans l'état de nature couvrent leurs nids de mouſſe, et, comme Mr. de Réaumur l'avoit obſervé, ils la ſolidifient au moyen d'une couche de cire fort mince qu'ils conſtruiſent au deſſous: mais lorſqu'on leur refuſe les matériaux néceſſaires, ou lorſque la nature les a placé trop loin de la mouſſe et des brins d'herbe, ils ſavent s'en paſſer, et conſtruiſent leur toit en cire ſeulement comme je viens de le raconter.

Le hazard m'a fait découvrir un trait de leur induſtrie que la nature ne m'eut certainement jamais offert. J'avois recouvert un nid de Bourdons avec une cloche de verre, comme je le fais ordinairement; les bords de la cloche ne poſoient pas exactement ſur la table où elle étoit placée; il y avoit même certains endroits où le plateau étoit ſi fort voilé, qu'un Bourdon auroit pû paſſer ſous les bords de la cloche avec la plus grande facilité. Je remplis les vuides avec de la toile groſſière; je la fis même entrer fort avant dans la cloche, afin de la fermer plus ſurement. La ruche étoit établie dans mon cabinet; un long canal vitré, adapté à la porte du nid, conduiſoit les Bourdons hors de la fenêtre par une ouverture que j'avois pratiquée dans le bois même de la croiſée, et au moyen de ces préparatifs je pouvois obſerver ſans riſquer d'être piqué. Je vis bientôt les Bourdons attaquer les morceaux de toile qui fermoient leur ruche; ils en arrachoient les fils les uns après les autres; ils les cardoient avec leurs dents, et les coupoient auſſi menus que des brins de coton; ils réuniſſoient enſuite ces brins avec leurs jambes; ils en formoient des floccons qu'ils pouſſoient derrière eux, à méſure qu'ils les avoient cardés. Pluſieurs Bourdons étoient continuellement

occupés à ce travail, tandis que d'autres individus de la peuplade s'occupoient à pouffer avec leurs jambes ces petits monceaux de coton contre le nid même; ils travaillèrent à éfiler cette toile pendant près d'un mois; ils en entourèrent leur nid d'un tas épais au moins d'un pouce et demi en certains endroits, et qui s'élevoit jufqu'à la moitié de la hauteur du nid. Quand ils eurent éfilé une plus grande quantité de toile, ils en couvrirent entièrement l'enveloppe, comme ils auroient fait avec de la mouffe, et même ils en firent entrer fous l'enveloppe une affez grande quantité pour fermer tous les vuides qu'elle pouvoit laiffer entre fon bord et celui du gâteau.

D'autres Bourdons déchirèrent la couverture d'un livre dont je m'étois fervi pour recouvrir la boëte où je les avois logé; ils coupèrent ces lambeaux de papier en fort petits morceaux, qu'ils réunirent au deffus de l'enveloppe de leur nid.

Il paroit donc que ces infectes favent profiter en de certaines occafions des matériaux que la nature ne pourroit leur préfenter: on verra dans le chapitre dixième ce qui peut avoir donné lieu aux Bourdons de déployer un talent et un inftinct auffi extraordinaire.

Si l'on met des morceaux de toile ou de papier dans une ruche d'Abeille, elles les déchirent avec leurs dents, et en emportent les débris hors de leur habitation. A quelle caufe pourroit-on attribuer cette différence de mœurs, entres des infectes dont l'inftinct paroit fi raproché? Ne feroit-ce point que les Abeilles inftruites à déchirer, à enlever les tiffus de foie filés par les teignes dans l'intérieur de leurs gâteaux, prennent la toile et le papier pour l'ouvrage de leurs ennemis? tandis que les Bourdons, fujets aux mêmes fléaux, ne favent point s'en défendre, et qu'ils n'enlèvent jamais les galeries que les teignes ourdiffent dans leurs gâteaux?

Les infectes qui vivent en fociété ont cela de commun avec les hommes, que leur induftrie augmente en raifon de leur nombre. Il femble qu'une grande population facilite les travaux de toute

efpèce;

eſpèce; et c'eſt dans les nids les plus peuplés qu'il faut obſerver les ouvrages des inſectes, pour connoître le plus haut point de leur induſtrie.

J'ai obſervé pluſieurs fois que les Bourdons de même eſpèce n'exécutoient pas auſſi bien les mêmes travaux lorſqu'ils étoient en petit nombre, que lorſque leurs nids avoient plus d'habitans. J'ai remarqué que ceux dont les familles étoïent moins nombreuſes ne doubloient point de cire leur toit de mouſſe, comme le font ceux qui habitent des nids bien peuplés; les premiers n'allongeoient pas leurs pots à miel, tandis que le beſoin forçoit les autres à uſer de cet artifice.

Il eſt cependant vrai, que pour commencer des obſervations il vaut mieux ſe contenter des familles les moins conſidérables; elles ſont plus faciles à examiner, le tableau en eſt moins confus, et l'on y peut ſuivre plus exactement les principaux traits de leur hiſtoire; mais ſi l'on déſire de connoître un plus grand nombre de faits, il ne faut plus s'en tenir aux ébauches de la nature, il faut chercher des détails nouveaux dans des nids bien peuplés. C'eſt là qu'on pourra rectifier ſes erreurs, et qu'après avoir généraliſé ſes idées, il ſera aiſé de les reduire à de juſtes bornes.

CHAPITRE VI.

De la Ponte.

LORSQUE la femelle a achevé la cellule qui doit recevoir ſes œufs, elle ſe met à pondre; mais elle eſſaie auparavant ſi le bout de ſon corps peut y entrer: quand elle la trouve trop étroite, elle en ſort et revient l'aggrandir; elle eſſaie une ſeconde fois, et ſi

les

les dimenſions de la capſule ne ſont pas exactement celles qui conviennent au bout de ſon ventre, elle évaſe plus ou moins les bords de l'alvéole; elle réuſſit enfin, à leur donner une meſure exacte, et on la voit alors s'établir ſur la cellule.

Cependant elle fait de vains efforts pour pondre, les lèvres de ſon anus ne s'ouvrent pas aſſez pour laiſſer ſortir ſes œufs; mais elle a été inſtruite à faire uſage d'un inſtrument qui favoriſe ſes efforts, et dont j'ai longtems ignoré l'utilité.

Cet inſtrument eſt l'aiguillon dont le bout de ſon corps eſt armé, et dont elle ne ſe ſert preſque jamais comme d'une arme offenſive.

L'aiguillon chez ces inſectes n'a d'autre iſſue que l'anus, et cet anus eſt compoſé de deux lèvres horizontales, qui s'ouvrent et ſe ferment l'une ſur l'autre.

Lorſque la femelle eſt établie ſur l'alvéole, et qu'elle eſt rête à pondre, elle entr'ouvre avec effort les lèvres de ſon anus, en fait ſortir ſon aiguillon, et le pouſſant fortement en arrière, elle l'enfonce dans le bord de la cellule, qu'elle perce de part en part; la lèvre ſupérieure de l'anus ſe trouve donc priſe entre l'aiguillon et le bord de l'alvéole; ſes pattes poſtérieures embraſſent en même tems la cellule, et preſſent contre l'aiguillon la cire molle dont elle eſt formée: au moyen de cette dernière opération elle y tient aſſez fortement. Voyez Tab. XXVII. Fig. 6.

Si j'oſois donner une explication de ce fait, voici ce que je dirois:

Les lèvres de l'anus ont une tendance naturelle à ſe rapprocher; il faut une force extraordinaire pour rompre cette force muſculaire; l'effort ſe fait du dedans au dehors; et ſi quelques muſcles agiſſent dans ce ſens en cette occaſion, il leur faut un point d'appui, pour que l'anus puiſſe s'ouvrir; il faut que ſes lèvres ne ſe ſuivent pas l'une l'autre; mais elles ſe ſuivront, tant que l'une des deux ne ſera pas retenue par quelques moyens extraordinaires; car rien n'eſt plus mobile que les derniers anneaux du ventre de la femelle. Mais où ſeroit

cette pince? où ſeroit ce point d'appui? La nature a inſtruite les femelles des Bourdons à le chercher ſur les bords de la cellule qui doit recevoir leurs œufs, à engager la lèvre ſupérieure de l'anus entre la cire de l'alvéole et leur propre aiguillon; et à former ainſi une eſpèce de pince, qui en leur donnant une aſſiette convenable force leur anus de reſter entr'ouvert, et facilite leur accouchement.

Lorſque les femelles ſe ſont fixées ſur leur cellule, comme je viens de le dire, elles pondent ſix ou ſept œufs de ſuite, ſans changer d'attitude.

Il n'y a point d'exemple d'une ponte de ce genre chez les Abeilles et chez les Guêpes.

Les inſectes qui diffèrent encore plus des Bourdons, leur reſſembleroient-ils à cet égard? Cela n'eſt pas vraiſemblable; il exiſte une variété infinie dans toutes les opérations de la Nature, et plus les claſſes ſont différentes, moins les détails ſe rapprochent.

Les œufs des Bourdons ſont d'une ligne de longueur, un peu recourbés, et plus gros à un bout qu'à l'autre.

Ils paroiſſent au microſcope en quelque ſorte ſemblables à du chagrin; ils ſont d'une couleur laiteuſe et remplis de liqueur.

Swammerdam dit que ces œufs ſont plantés dans la cire de leur cellule par leur bout le plus pointu; ce fait n'a pas été confirmé par mes obſervations; j'ai toujours trouvé les œufs de Bourdons couchés les uns à côté des autres; ou les uns ſur les autres, ſans aucun ordre; la déſcription qu'il en a donnée eſt d'ailleurs exactement conforme à ce que j'ai vû.

A peine la femelle a-t-elle achevé de pondre, qu'elle ſonge à renfermer ſes œufs; elle rabat ſur eux les bords de leur petite loge; elle va ramaſſer ſur les coques de ſoie et ſur les pots à miel une ſuffiſante quantité de cire, pour enfermer ſes petits; elle remplit avec le plus grand ſoin les moindres interſtices; elle achêve ainſi la cloiſon ſupérieure de leur logement, et ſe couche ſur la cellule, en remuant

très vivement le bout de son corps au dessus de leur berceau, comme si elle vouloit les couver ; elle reste quelquefois vingt minutes sur la cellule ; elle la quitte pour quelques instans, et y revient bientôt après.

Faire une cellule, la garnir de pollen, pondre des œufs, les renfermer—voilà bien des opérations—elles sont faites en une demi-heure : si l'on s'étonne de cette rapidité, l'on ne sera pas moins surpris de la cause qui oblige cette mère à se hâter si fort.

Au moment où ses œufs sont pondus, et lorsqu'elle commence à les renfermer, on voit les ouvrières se précipiter sur leur cellule, et essayer d'en dérober quelques-uns ; elles attaquent même ces œufs, lorsque la mère est occupée à les pondre ; mais celle-ci a donné de si exactes dimensions aux bords de l'alvéole, que les ouvrières ne réussissent point à les enlever pendant qu'elle reste sur la cellule ; ces ouvrières harcellent cependant de telle manière l'extrêmité de son ventre, qu'elle se retourne en fureur, et les poursuit jusqu'au bas du nid, battant des ailes.

D'autres Bourdons profitent du moment où la mère s'est écartée ; ils viennent sur la cellule avec les mêmes signes d'avidité, et en tirent à la dérobée un œuf, dont ils boivent le suc laiteux, et dont ils rejettent la coquille, qui n'est qu'une membrane transparente.

Quand la femelle revient pondre de nouveaux œufs, et qu'elle voit les Bourdons dévorer ceux qu'elle a déjà pondu, elle leur tombe dessus à coups de dents, les poursuit au fond du nid, et chasse tous ceux qui veulent approcher de sa cellule ; jamais le voleur n'éprouve d'autres effets de sa colère ; elle ne se sert point contre lui de son aiguillon ; car, individus pour individus, ils sont tous égaux pour la nature, et celui qui est déjà parvenu à l'état de perfection vaut à ses yeux celui qui ne fait que de naître.

Lors même que ces œufs sont fermés ils ne sont point à l'abri de la gourmandise des ouvrières ; elles savent entr'ouvrir la cellule, et

attaquer ſes habitans ; la ſurveillance de la mère peut ſeule les en garantir.

Celle-ci fait alors la garde autour de ſes petits, avec une vigilance étonnante, pendant ſix ou huit heures.

Il paroit que les vieux œufs ſont moins recherchés des ouvrières que ceux qui ſont nouvellement pondus ; en effet, j'ai rarement vû les ouvrières les attaquer le ſecond jour.

J'eſſayai une fois de leur offrir de vieux œufs, au moment où elles attaquoient les nouveaux; elles renfermèrent ſoigneuſement les premiers, ſans tenter de s'en nourrir.

Que penſer de la Nature, quand elle ſemble donner aux inſectes la faculté de détruire leur propre eſpèce, lorſqu'elle permet aux Abeilles de tuer leurs mâles, et qu'elle laiſſe aux Bourdons le droit et l'envie de dévorer les œufs nouvellement pondus ?

Ne ſembleroit-il pas naturel d'en conclure, qu'elle veut opérer une déſtruction totale ? Cependant les eſpèces ſe conſervent, les familles ſe multiplient, les loix ne ſont point changées ; et il paroit au contraire, que c'eſt par le ſacrifice de quelques individus que la conſervation de l'eſpèce eſt aſſurée. Des obſervations particulières nous apprennent, que les Abeilles ne tuent leurs mâles que lorſqu'ils ſont devenus inutiles à leur peuplade ; ils conſommeroient une grande partie des proviſions, dont les Abeilles ont beſoin pour ſe nourrir pendant l'hiver ; et la Nature a préféré la conſervation des individus induſtrieux, à celle des mâles qui ne ſont plus d'aucun ſervice après le tems de la fécondation.

Quand au pillage des œufs de Bourdons, il faut en chercher la cauſe plus loin.

Il ne paroit d'aucune utilité à la peuplade même ; car les œufs qui ſont expoſés à la gloutonnerie des ouvrières ſont auſſi bien des œufs d'ouvrières que des œufs de mâles et de femelles.

Mais

Mais peut-être l'Auteur de la nature a-t-il voulu diminuer par là le nombre des mellivores.

Les Bourdons ſont les plus grands des inſectes qui ſe nourriſſent de miel; et ſi leur nombre étoit triple et quadruple, d'autres inſectes ne trouveroient plus de nourriture, et peut-être leur eſpèce ſeroit-elle détruite.

Cet argument prendra plus de force ſi l'on remarque avec quel ſoin la Nature a mis des entraves à la trop grande population des Bourdons. Ces inſectes ont pluſieurs ſortes d'ennemis; entr'autres une eſpèce de fauſſe teigne, et un gros ver blanc, qui ſe nourriſſent de leur cire, de leurs nymphes, et d'eux-mêmes quelquefois; ils ſont même chargés d'une nombreuſe famille de poux, qui s'attachent à leur corſelet, et qu'ils emportent avec eux dans les airs.

CHAPITRE VII.

Des Vers de Bourdons, et de la Manière dont ils ſe nourriſſent.

SWAMMERDAM n'ignoroit pas que les Guêpes donnent la béquée à leurs petits; que ceux de l'Abeille maçonne ſe trouvnt entourés, au ſortir de l'œuf, des alimens que leur mère a préparé; il ſavoit enfin, que les Mouches à miel préparent une bouillie particulière; qu'elles la mettent dans les cellules qui ſervent de berceau à leurs petits; qu'elles les nourriſſent jour à jour; et, ce qui eſt plus remarquable, qu'elles proportionnent la quantité et la qualité de cet aliment à l'âge et au ſexe de chaque individu.

Il paroit qu'il n'avoit pas obſervé les mœurs et l'induſtrie des Bourdons; rejettant les lumières que l'analogie pouvoit lui offrir, il veut que les petits de ces inſectes ſe nourriſſent de la matière même dont leurs berceaux ſont compoſés.

Je

Je ſais tout ce qu'on doit de confiance aux lumières de ce grand anatomiſte; mais il ne parle point ici d'après ſes propres obſervations, et je me trouve heureux de n'avoir à combattre qu'une conjecture, à laquelle il n'attachoit pas un grand prix.

Le ſimple récit des faits prouvera, je l'eſpère, que les vers de Bourdons ne ſe nourriſſent point comme ceux qui habitent nos fruits; qu'ils ne mangent pas la cellule qui leur ſert de berceau; que leurs nourrices connoiſſent l'inſtant où leurs petits ſont éclos, et où ils ont beſoin de leurs ſecours; qu'elles ouvrent alors leurs cellules pour leur donner à manger; qu'elles le font avec trop de délicateſſe pour pouvoir leur nuire; et qu'elles ferment après cela l'ouverture de l'alvéole; on verra enfin que les Bourdons nourriſſent en certain tems leur petits comme les Abeilles maçonnes, et en d'autres comme les Guêpes et les Mouches à miel.

Les vers de Bourdons ſont apodes et de couleur blanche; Mr. de Réaumur dit qu'ils ont ſur les côtés des taches noires de figure irregulière, plus longues que larges, et diſpoſées tranſverſalement: je n'en ai vû aucunes ſur le corps des vers que j'ai obſervé.

On diſtingue aiſément la tête de ces vers, dont la lèvre inférieure eſt fort avancée.

Leur corps eſt compoſé de treize ou quatorze anneaux.

Le cœur de ces inſectes paroit au travers de la peau: quand on les regarde du côté du dos il eſt rempli d'une liqueur tranſparente, et s'étend en ligne droite de la tête juſqu'à l'anus; j'ai toujours vû ces vers courbés ou en cercle; leur grandeur varie ſuivant l'âge, le ſexe, et l'eſpèce; ceux des femelles ſont toujours les plus grands.

Les vers de Bourdons ſortent de leurs œufs au bout de 4 à 5 jours; ils ſe nourriſſent d'abord du pollen préparé dans leur cellule; mais la proviſion qu'on leur en a fait n'étant pas conſidérable, ils n'ont pas des vivres pour fort longtems, ils dépendent alors des ſoins des ouvrières.

Celles-ci viennent ſur la cellule ; elles font avec leurs dents un petit trou dans la cire du couvercle ; elles parcourent après cela les gâteaux, pour chercher du miel ou du pollen ; on les voit enſuite revenir ſur le berceau de leur petits, mettre leur tête dans l'ouverture qu'elles ont pratiquées, pénétrer juſques aux vers, reſter quelques inſtans dans cette attitude, retirer enſuite leur tête, et fermer la cellule.

Pendant que les Bourdons font les fonctions de nourrice, il eſt impoſſible de voir quelle matière ſort de leur bouche ; mais j'ai obſervé qu'ils font alors avec les anneaux de l'abdomen les mêmes mouvemens que pour dégorger le miel dans les réſervoirs qui lui ſont deſtinés ; les anneaux de leur abdomen rentrent les uns dans les autres, et le ventre ſe raccourcit conſidérablement ; leur bouche s'ouvre au même inſtant, et on voit découler dans les réſervoirs une partie du miel qui étoit dans leur eſtomac ; hors puiſqu'ils font le même mouvement lorſqu'ils mettent leur tête dans la cellule, ce n'eſt point apparemment par une ſimple curioſité qu'ils l'avoient ouverte, il eſt bien plus probable que c'étoit pour nourrir les jeunes vers; et les obſervations ſuivantes confirment cette conjecture.

Quand ils nourriſſent leurs vers on ne peut appercevoir ſi c'eſt avec du miel ou avec du pollen ; il eſt à croire que c'eſt avec du pollen, puiſque c'eſt une nourriture qui leur convient dès l'enfance, et que les Bourdons eux-mêmes en mangent avec paſſion ; j'ai chaſſé de deſſus une cellule une ouvrière qui venoit de nourrir un ver, avant qu'elle eut eu le tems de boucher l'ouverture qu'elle y avoit faite ; j'ai écarté les parois de la cellule; le ver y étoit couché en cercle à peu près horizontalement ; le centre du ver etoit rempli d'une liqueur jaune retenue par les peaux de ſon ventre; je goutai cette liqueur, et j'y reconnus le goût du pollen mêlé avec le miel des Bourdons.

J'ai réuſſi à nourrir pendant pluſieurs jours un ver de femelle avec du pollen et du miel de ces inſectes ; ce qui me confirme encore dans mon opinion c'eſt que j'ai toujours trouvé l'eſtomac de ces vers rempli

rempli d'une matière jaune friable, très compacte, et ſemblable au pollen.

Les Bourdons ne préparent jamais de pollen dans les cellules qui doivent ſervir de berceau aux mâles et aux femelles ; les uns et les autres ne naiſſent ordinairement qu'au mois d'Août et de Septembre ; les ouvrières paroiſſent dès les mois de Mai et de Juin.

Quelle peut être la raiſon de la différence des ſoins que les ouvrières donnent aux mouches des trois ſortes ?

Ce n'eſt pas qu'il y ait moins de pollen ſur les fleurs au mois d'Août qu'il n'y en a au mois de Juin ; car les ouvrières en apportent tous les jours, dans les mois d'Août et de Septembre, et d'ailleurs elles en ont fait proviſions conſidérables à cette époque : mais voici l'explication que je pourrois donner de cette négligence apparente.

Le nombre des ouvrières eſt beaucoup plus grand au mois d'Août qu'il ne l'eſt au mois de Mai ; à peine trouve-t-on au printems quelques ouvrières dans les nids de Bourdons ; la mère commence ſeulement alors à n'être plus ſolitaire ; dans les mois d'Août et de Septembre, au contraire, leur nombre eſt très conſidérable.

Les vers qui ſont nés dans les mois de Mai et de Juin courroient le riſque de manquer de nourriture s'ils n'avoient pas des proviſions dans leurs cellules ; car le petit nombre des ouvrières ne permettroit peut-être pas qu'elles apperçuſſent le moment où ils écloſent, et celui où ils ont beſoin d'alimens, tandis qu'à la fin de l'été leur nombre peut ſuffire à ſurveiller et à nourrir tous les vers. La nature devoit donc pourvoir au défaut du ſoin des ouvrières dans les tems où elles ſont en plus petit nombre ; mais cela étoit moins néceſſaire à la fin de la ſaiſon, quand les ſoins et les ſecours étoient plus faciles à obtenir.

Lorſqu'en automne les teignes et les autres ennemis des Bourdons viennent attaquer leur nid, et qu'ils mangent les proviſions journalières de la peuplade, un grand nombre d'ouvrières périt, et

les

les vers ne ſont que très mal ſoignés ; ils n'ont pas de vivres dans leurs cellules, et ne reçoivent aucun ſecours du déhors, ils meurent de faim dans leurs loges de cire, qui ne peuvent donc point leur ſervir de nourriture comme le croyoit Swammerdam.

Je ne puis terminer ce qui regarde la nourriture des vers, ſans m'arrêter ſur une obſervation qui ſembleroit contredire en partie ce que j'ai écrit ſur cette matière.

J'ai trouvé au printems, dans tous les nids de Bourdons, des boules de cire plus groſſes qu'aucunes de celles dont j'ai parlé ; lorſque j'enlevai la ſuperficie de ces boules, je reconnus qu'elle étoit, en effet, une pellicule de cette matière à laquelle j'ai conſervé le nom de cire ; je croyois devoir trouver au deſſous de cette pellicule un aſſez grand nombre de gros vers, mais je n'y vis qu'une couche épaiſſe, ou plutôt une maſſe d'une matière jaune et compacte, que je reconnus pour du pollen empilé et ſerré ; j'ouvris ce maſſif de pollen, et je trouvai dans ſon intérieur quantité de petits vers de Bourdons raſſemblés ; les vers s'y nourriſſoient du pollen qui les entouroit, ainſi que les vers du fruit, et du fromage, ſe nourriſſent des parois de leur habitation ; bientôt toute leur proviſion étoit conſommée, et ils ſe trouvoient ſous la cire expoſés à mourir de faim ; mais les ouvrières appercevoient en paſſant ſur leur logement, peut-être, qu'ils n'étoient plus environnés de pollen, et qu'ils étoient à nud ſous la cire ; elles les nourriſſoient donc à leur manière ordinaire, et dès lors le ſort de ces inſectes ne différoit plus de celui des vers dont j'ai parlé.

Ces détails ſuffiſent pour donner une idée aſſez exacte de la manière dont les Bourdons nourriſſent leurs petits ; je vais paſſer à ce qui regarde leur accroiſſement.

CHAPITRE VIII.

De l'Accroissement des Vers du Bourdon.

LES vers de Bourdons enfermés ensemble dans de petites loges de cire, avoient à prendre plus d'accroissement en tout sens avant de se transformer en nymphes ; ces loges étoient bien proportionnées à leur petitesse actuelle, mais je ne concevois pas comment ces vers, pressés les uns contre les autres, pourroient se mouvoir, ou se développer dans un espace aussi étroit : l'observation m'apprit ce que je n'avois pu diviner ; je vis, en suivant ces loges avec beaucoup d'attention, et en les mesurant de jour en jour, que leurs dimensions n'étoient plus ce qu'elles avoient été dans l'origine. Ces loges, que j'avois vu grosses au plus comme un pois lorsque la mère leur avoit confié ses œufs, étoient devenues par dégrés aussi grosses que des petites noix.

Mais comment ces loges s'agrandissoient-elles ? c'étoit un nouveau problème ; il n'auroit pas été difficile à résoudre, si l'opinion de Swammerdam sur la nourriture des vers avoit été plus fondée qu'elle ne l'étoit réellement ; car s'il eut été vrai que les vers de Bourdons se nourrissent en mangeant la cire de leur alvéole, il auroit été permis de supposer que leurs nourrices se seroient apperçues de leur nudité comme de leurs besoins, qu'elles se seroient hâtées de les entourer d'une nouvelle couche de cire, et qu'en reconstruisant leur berceau, elles l'auroient proportionnée à leur âge et à leur grosseur.

Mais on a vu dans le chapitre précédent, que les vers de Bourdons ne mangent point leur propre cellule ; je fus donc obligé de chercher une explication plus satisfaisante, et qui s'accordât mieux avec les faits que j'avois observé.

L'agran-

L'agrandiſſement des loges de cire n'avoit été remarqué par aucun naturaliſte. Un trait auſſi neuf, et auſſi intéreſſant, piqua ma curioſité, et je réſolus de ne rien negliger pour la ſatisfaire.

Cette recherche fut longtems infructueuſe; malgré tous mes efforts, je ne parvenois point à ſaiſir le moment où les loges s'agrandiſſoient; celles que j'avois meſurées l'inſtant d'auparavant n'avoient plus les mèmes dimenſions quand je revenois les obſerver.

Les traits les plus intéreſſans de l'hiſtoire naturelle ne ſont pas d'abord ſur nous tout l'effet qu'ils devroient produire, et ce n'eſt qu'après bien des obſervations qu'on peut eſpérer de voir ce qu'ils ont de plus ſaillant: on regarde ſouvent le premier apperçu comme un fait douteux; s'il ſe préſente encore il devient plus digne d'attention; mais il n'a tout ſon interêt, et il n'excite vraiment notre curioſité, que lorſqu'on en ſoupçonne le principe et le but.

Ce n'eſt que d'après un apperçu auquel je ne m'étois pas arrèté que je ſuis parvenu à découvrir la manière dont s'agrandiſſent les loges des vers.

J'avois vu dès le mois de Juin de grandes cellules de cire ouvertes par deſſus, et qui laiſſoient appercevoir dans leur intérieur pluſieurs vers de Bourdons reſtés à découverts; j'avois remarqué que les ouvrières en enlevoient quelques-uns et les emportoient hors de leur ruche; je m'intéreſſois à ces inſectes, et je les ſuivis pour connoître leur ſort; je negligeois de regarder ce qui ſe paſſoit ſur le nid; et lorſque je revenois à l'obſerver, je remarquois ſeulement que ces loges étoient refermées.

Ce ne fut que lorſque je m'occupai particulièrement de rechercher la manière dont ces loges s'étoient agrandies, que je me rappellai ces obſervations, et que je ſoupçonnai leur importance; je me condamnai donc à viſiter ces cellules de quart d'heure en quart d'heure, et à ne les quitter que lorſque j'aurois pris la nature ſur le fait.

Le 13 Août j'obfervai plufieurs loges de cire de différente grandeur ; une de ces cafes fe fendit fous mes yeux ; la fente étoit longue de plufieurs lignes, parceque la loge entr'ouverte étoit déjà d'une groffeur confidérable.

Comme il n'y avoit point de Bourdon fur cette loge, je ne pûs douter que l'ouverture obfervée à fa furface ne fut la fuite naturelle d'un mouvement, ou d'un effort, qu'avoient fait les vers dont elle étoit remplie ; la preffion latérale de des vers, dont la taille croiffoit chaque jour, devoit enfin obliger la légère cloifon de cire qui les gênoit, à fe fendre et à s'entr'ouvrir ; et ce qui me prouva que c'étoit leur feule preffion qui avoit occafionné la déchirure dont je viens de parler, c'eft que le ver qu'elle laiffoit appercevoir dans toute fa longueur ne montroit que fon dos à l'obfervateur ; s'il eut rongé la cellule pour l'entr'ouvrir, ç'auroit été fon ventre et fes dents que l'on auroit apperçu.

Il reftoit à voir de quelle manière cette loge feroit renfermée. Je n'attendis pas longtems : une ouvrière s'approcha de la loge entr'ouverte, et dès qu'elle eut apperçu la fente, ou le ver qu'elle laiffoit à nud, je la vis chercher de la cire fur différentes parties du gâteau, la prendre avec fes dents, la porter fur la loge, et la placer entre les bords de fon ouverture : quand elle eut employé toute la cire qu'elle avoit apporté, elle alla en prendre de la nouvelle fur les cellules voifines ; elle revint bientôt avec fa charge, de nouveaux brins de cire furent ajoutés à ceux qu'elle avoit placé précédemment ; et quand elle eut répété trois ou quatre fois cette manœuvre la fente fe trouva fermée, et la cellule agrandie de toute la largeur de la pèice qu'elle avoit fabriquée ; elle fit à peu près comme cette teigne, qui, après avoir coupé longitudinalement fon fourreau, l'élargit en y mettant une pièce, ou comme la couturière qui élargit la manche d'une robe.

Chez les Bourdons, les ouvrières ne coupent point une pièce de

cire

cire pour l'ajuſter ſur l'ouverture de la cellule; elles conſtruiſent entre les deux bords de la fente une plaque qui ne ſe forme qu'à meſure qu'elles apportent de nouveaux brins, et qu'elles les maçonnent avec les autres; mais quoiqu'elles ayent à faire bien plus d'ouvrage que les teignes, la clôture et l'élargiſſement d'une cellule ne leur prend pas beaucoup de tems; celle que je ſuivis dans cette obſervation n'employa qu'une minute à ce travail.

Voilà comment ces alvéoles, qui ne contiennent ordinairement que ſix ou ſept vers, peuvent devenir de la groſſeur d'une noix.

La forme de ces grandes loges eſt quelquefois irrégulière; leur augmentation graduelle ne l'eſt pa moins.

Le 21 de Juin je vis une femelle pondre des œufs dans une cellule; le 24 ou le 25 je trouvai des vers de Bourdons à la place des œufs; le 27 ils avoient 3 ou 4 lignes de longueur, et leur cellule s'étoit agrandie de ſix à ſept lignes; le 1 Juillet les Bourdons la réunirent à deux petites cellules voiſines occupées par des œufs, ou par des vers qui venoient d'éclore; ce logement étoit d'une forme extraordinaire. Sa longueur étoit à peu près de dix-ſept lignes; ſa largeur varioit ſuivant la partie où on la meſuroit; elle avoit en quelques endroits cinq lignes, en d'autres deux ou trois ſeulement; ſa hauteur dépendoit auſſi du nombre et de la groſſeur des vers qui habitoient les différentes parties de la loge, car ils étoient ſouvent placés les uns au deſſus des autres ſans ſe déranger mutuellement.

Le 2 Juillet la loge avoit reçu quelque accroiſſement à l'une de ſes extrêmités, elle avoit ſept lignes en cet endroit.

Le 3 la même extrêmité eut onze lignes de largeur, ce fut le terme de l'accroiſſement de cette partie; la cellule ne groſſiſſoit pas par tout également, ni même en proportion, parceque les vers étant plus ou moins nombreux, ou plus ou moins agés, dans les divers points de ſa longueur, la faiſoient élargir de manière différente dans une progreſſion plus ou moins rapide.

Sa plus grande longueur fut de deux pouces; et tandis que les vers d'une extrêmité filoient leur coque, ceux de l'autre commençoient à peine à prendre quelque accroiſſement; la cellule prit enfin la forme d'une poire, bien différente des autres, qui étoient ordinairement circulaires, et un peu bombées.

Je remarquai à peu près dans le même tems une autre ſingularité rélative à un cellule de ce genre.

Les Bourdons d'une de mes cloches avoient conſtruit horizontalement un pillier de cire, qui partoit du bord du gâteau, et qui alloit ſoutenir l'enveloppe du nid; ils formèrent une petite cellule ſur le pillier même; elle fut bientôt peuplée de petits vers, qui groſſirent, et qui firent augmenter les dimenſions de leur habitation; comme elle s'accrût à la manière ordinaire, elle pouſſa l'enveloppe à une plus grande diſtance des gâteaux, et devint ſi maſſive, que les Bourdons furent obligés de la ſolidifier, au moyen de pluſieurs pilliers fort larges et fixés d'une part au gâteau, et de l'autre à ſon enveloppe cireuſe. Voyez TAB. XXVI. Fig. 1.

Lorſque les vers ont pris tout leur accroiſſement, ils ont un demi-pouce de longueur; c'eſt à cette époque qu'ils ont un véritable rapport avec les chenilles; ils ſavent, comme elles, ſe filer une coque de ſoie; on en verra les détails dans le chapitre ſuivant.

CHAPITRE IX.

Des Coques de Soie que filent les Vers de Bourdons avant leur Métamorphoſe.

LES vers qui avoient juſqu'alors habité la même cellule vont paſſer une partie de leur vie dans la ſolitude; chaqu'un d'eux ſe conſtruit un logement à part ſous le toit de cire où ils vivoient en commun.

La

La nourriture ne leur eſt plus néceſſaire ; leur logement ſera impénétrable pour les ouvrières ; la ſoie dont ils le conſtruiſent eſt ſi ſolidement tiſſée, que les dents de ces inſectes n'ont aucune priſe ſur elle ; cette ſoie eſt blanche, et d'une fineſſe ſingulière.

La forme des coques n'eſt pas la même en tout tems ; elle eſt d'abord celle d'une boule applatie. Tab. XXVI. Fig. 2. a. Le ver y eſt couché en cercle, elle deviendra oblongue. Tab. XXVII. Fig. 1. a. et le ver s'y tiendra de bout.

Le ver n'a plus beſoin d'aliment lorſqu'il a filé ſa coque ; et quand les ouvrières ou la mère viennent lui donner la nourriture, elles trouvent ſous la cire un tiſſu difficile à rompre, et renoncent à le ſoigner.

Les vers enfermés d'abord dans la même cellule filent à peu près dans le même tems ; les ouvrières dégarniſſent peu à peu leurs coques de ſoie de la cire qui les recouvre, et l'employent à différens uſages. Ce n'eſt qu'alors qu'on peut appercevoir la forme de ces nouveaux logemens ; les Bourdons en enlèvent la cire, l'étendent ſur toute leur ſurface ; la voûte qui cachoit la forme des loges conſtruites dans l'intérieur cède ſous leurs pas ; elle fait voir en boſſes et en creux ces coques, et leurs intervales.

Au bout de deux ou trois jours ces coques ont entièrement changé de couleur, preſque toute la cire a diſparu, et ce qui en reſte n'a qu'une légère teinte de jaune.

Les vers n'ont plus qu'une opération à faire avant de paſſer à l'état de nymphe ; la poſition circulaire qu'ils ont gardée n'eſt point celle qui leur convient pour ſe transformer. Avant de perdre leur peau, chaqu'un d'eux ſe redreſſe dans ſa cellule, qui n'étant plus garnie de cire ſe prête à tous ſes mouvemens ; il lui fait prendre alors la forme d'un ovoïde alongé, dont le grand axe eſt vertical ; et ſi l'on fend la loge de ſoie de haut en bas, on trouve le ver dans la ſituation où il eſt repréſenté dans la Tab. XXVII. Fig. 1.

Monſieur

Monſieur de Réaumur n'a point vû ce changement de forme des coques ; il dit même que les vers ont la tête tournée en embas dans leurs loges de ſoie, et qu'ils ſortent enſuite par deſſous.

Ces deux aſſertions ne ſont pas confirmées par l'obſervation ; mais avant de la prouver, je vais raconter les expériences qui établiſſent la réalité de ce changement de forme.

J'ai longtems cherché à voir cette transformation ; elle ſe paſſe dans un moment ſi court, que je n'ai jamais pu en être le témoin ; je me contentai donc de m'aſſurer du fait par deux expériences.

Première Expérience.

Je mis un nid de Bourdons dans une boëte vitrée ; au haut du nid étoit une coque de femelle nouvellement filée ; elle étoit encore applatie, et cylindrique ; ſon diamètre étoit de ſix lignes, et ſa hauteur de quatre ; la forme et les dimenſions de cette coque indiquoient le ſexe de l'individu qui l'habitoit ; je meſurai la diſtance qui étoit entre la coque et le cryſtal ; il étoit bien aiſé de ſavoir ſi elle s'alongeroit en meſurant enſuite cette diſtance.

Au bout de deux jours cette coque fut entièrement dégarnie de cire ; le troiſième, j'apperçus un changement conſidérable dans ſes dimenſions ; ſa forme étoit à peu près celle d'un œuf ; elle avoit cinq lignes de diamètre dans ſa partie inférieure, et trois ſeulement à ſon autre extrêmité ; ſa longueur me parut d'environ huit lignes ; elle touchoit alors à la glace dont la boëte étoit recouverte, et les Bourdons eſſayèrent de l'attacher au verre avec de la cire : mais ce fut inutilement ; leurs dents ne pouvant paſſer entre la coque et la glace, ils y renoncèrent.

Seconde Expérience.

Je voulois m'aſſurer que les vers ne ſe fileroient pas deux coques, l'une platte et l'autre alongée ; je marquai donc avec de l'encre le milieu d'une coque applatie ; au bout d'un jour elle avoit changé de forme, et la marque que j'y avois fait pouvoit encore ſe diſtinguer.

Ces

Ces deux expériences ne me laissèrent aucun doute sur ce changement de forme.

C'est de la réunion d'un nombre, plus ou moins grand, de coques semblables que se forment les gâteaux des Bourdons; chaque cellule de cire donne lieu à la formation de sept à huit coques de soie, qui adhérent ensemble, parceque les vers, en les filant, les ont attachees les unes aux autres: lorsque tous ces petits gâteaux sont réunis, ils n'en forment plus qu'un seul, qui paroit à cause de cela très irrégulier, quoiqu'il soit composé de parties assez régulières.

On voit quelquefois deux ou trois grands gâteaux de coques rangés les uns au dessus des autres, et qui ne sont liés ensemble que par un peu de cire.

C'est dans ces coques oblongues que les vers passent à l'état de nymphes (Tab. XXVII. Fig. 1. *b.*); qu'ils perdent la peau, ou la robe, dont la nymphe étoit recouverte, et qu'ils se montrent sous la forme de Bourdon; il ne leur manque que la couleur, la force, et le mouvement: au bout de quinze jours ils ont acquis tous ces avantages, ils sont des insectes parfaits.

Leurs membres se sont durcis, et sont devenus écailleux: ces insectes sont armés de dents également écailleuses; leur corps est couvert d'un duvet gris, qui se colorera lorsqu'il aura été exposé à la lumière.

Ces Bourdons commencent alors à se servir de leurs dents; chacun d'eux ronge sa prison aux deux tiers de sa hauteur; dès qu'il a commencé, d'autres Bourdons viennent l'aider; ils la déchirent horizontalement un peu au dessus du renflement; au bout d'un quart d'heure le nouveau Bourdon commence à sortir de sa coque, et le premier usage qu'il fait de sa liberté est d'aller aux provisions.

CHAPITRE X.

Sur l'Uſage des Coques de Soie lorſque les Bourdons en ſont ſortis.

PLUS je compare les Bourdons avec les Abeilles, plus je trouve les loix par leſquelles ils ſe gouvernent adaptées à la ſituation, à l'état de ces peuplades.

Là, c'eſt un peuple ſi nombreux, que la peine et les travaux n'y ſont point épargnés; la matière ſeule y eſt précieuſe, parcequ'elle doit ſervir de berceau à un infinité d'individus; cette matière doit être d'uſage pendant pluſieurs années; auſſi, avec quelle adreſſe les Abeilles ne la travaillent-elles pas! et quels ſoins n'apportent-elles pas pour donner à leur ouvrage toute la ſolidité dont il eſt ſuſceptible!

Chez les Bourdons, la cire groſſière dont ils ſe ſervent eſt ſouvent plus abondante qu'il ne faut, mais le nombre des individus eſt fort petit, par conſéquent la main d'œuvre très précieuſe: on reconnoitra par tout, combien la nature a eu ſoin de ne leur donner que des ouvrages faciles à exécuter.

Toutes les coques de ſoie que les jeunes Bourdons ont habité ont été coupées dans un plan horizontal, un peu au deſſus de leur renflement; le ver ne ſongeoit pas vraiſemblablement, en filant ſa coque, à l'utilité dont elle pouvoit être à la peuplade, quand elle ne ſeroit plus néceſſaire à ſon propre perfectionnement; mais celui qui dirige tout dans la nature dirigeoit auſſi ſes opérations.

La ſoie dont ces coques ſont faites, le tiſſu ſerré que les vers leur ont donné, la couche de cire dont elles ſont enduites, et dont tous les fils ſont imprégnés; la forme d'œufs tronqués qu'elles ont priſe quand

les

les Bourdons en ſont ſortis, tout ſemble annoncer que ces coques doivent être d'un autre uſage pour la communauté.

C'eſt à contenir leur miel, et leur pollen, que les Bourdons ſavent les employer; toutes les circonſtances dont je viens de parler les rendent propres à cet uſage; mais avant de leur confier leurs proviſions, les ouvrières viennent enlever de deſſus leurs bords les lambeaux de ſoie que les jeunes Bourdons y ont laiſſé; elles égaliſent de leur mieux les contours de ces coques, et les enduiſent d'une épaiſſe couche de cire.

Chaque eſpèce de Bourdon perfectionne ſes pots d'une manière différente.

Les uns élèvent au deſſus du bord des coques de longs tubes évaſés, et compoſés de cire. (Tab. XXVII. Fig. 8.) D'autres y conſtruiſent des eſpèces de tubes, renflés au milieu, et retreins à l'ouverture, comme dans la figure 9.

Quelquefois ils ſe contentent d'ajouter à leurs bords intérieurs un anneau de cire, comme dans la figure 10.

D'autres fois ils rendent à la coque ſa forme originale, et ils ne laiſſent qu'une petite ouverture à ſa partie ſupérieure. Voyez fig. 11.

Enfin ils montrent qu'ils ne ſont pas inférieurs aux Abeilles dans l'art de l'économie; entre quatre pots alongés au moyen de ces tubes il ſe fait néceſſairement un vide; les Bourdons ſavent en profiter; ils en forment un cinquième pot, lui donnent un bord, l'arrondiſſent comme celui des autres, et s'en ſervent comme d'un reſervoir. Il n'eſt pas de la même forme que ceux qui l'entourent, il eſt quelquefois un peu quarré; s'il étoit régulier, il ne rempliroit pas tout le vide qu'on a laiſſé entre les autres pots; d'ailleurs, la groſſièreté et l'irrégularité de l'ouvrage laiſſent peu de champ à la géométrie. Fig. 12.

Les Bourdons regardent alors toutes les coques comme de ſolides

 réſervoirs,

réſervoirs, auxquels ils peuvent confier leurs proviſions; quand ils reviennent de la campagne, ils cherchent à l'inſtant à décharger leur eſtomac du miel qu'ils ont recueilli ſur les fleurs; ils viſitent les pots comme pour s'aſſurer qu'ils ſont biens conſtruits; puis ils y font entrer leur tête, et une partie de leur corſelet, (fig. 73.) ils ouvrent leur bouche, et raccourciſſent leur corps, comme je l'ai dit ailleurs, le miel tombe dans le réſervoir, et les Bourdons retournent à la campagne.

On voit ſouvent près de ſoixante de ces pots dans un ſeul nid; j'en ai compté, au moment de la floraiſon des tilleuls, plus de quarante, qui furent remplis de miel dans un ſeul jour; quand ils ſont pleins, les Bourdons en rétréciſſent l'ouverture, mais ils ne la ferment preſque jamais.

Ces inſectes ne ſavent pas ſe nourrir les uns les autres, comme le font les Guêpes et les Abeilles; c'eſt dans ces pots toujours ouverts que chacun d'eux puiſe à ſon tour le miel dont il a beſoin.

Les Bourdons ſavent auſſi conſtruire des pots de cire, ſans le ſecours des coques; ils leur donnent ordinairement un fond de cire, d'autres fois ils ne font qu'élever des tubes de cette matière ſur le parquet ou ſur les bords de leurs gâteaux.

Le miel dont ils rempliſſent leurs magazins eſt auſſi doux que celui des Abeilles; il eſt plus coulant et plus clair, il a auſſi un goût particulier, mais il ne laiſſe pas de ſaveur âpre à la gorge.

Ces proviſions ne ſervent guère que pour la nourriture journalière; d'ailleurs il eſt rare que tous les pots ſoient pleins, et les vivres ſont bientôt conſommés.

Aux mois de Mai et de Juin on ne trouve des pots qu'au milieu du gâteau; parceque c'eſt là que ſont nés les premiers Bourdons.

Quand la mère pond enſuite les œufs de mâles et de femelles, c'eſt

ſur

ſur les premières coques qu'elle établit les petites cellules où elles les enferme; ils y croiſſent et font agrandir chaque jour leur logement; ils y filent des coques, dont la réunion compoſe un ſecond gâteau. Ces coques ſervent enfin de magazin aux Bourdons, comme celles des ſimples ouvrières.

Je dois faire obſerver ici, que les mâles et les femelles ſont élevés dans les mêmes cellules de cire, et qu'ils y ſont nourris de la même manière. Les coques ſoieuſes des femelles ſe montrent au milieu des coques de mâles, et elles ſervent enſuite de reſervoir comme les autres; ils ont l'avantage d'être plus grands.

Ces coques ſervent auſſi de magazin pour les pouſſières d'étamines que les Bourdons apportent dans leur nid; je n'ai point vû de quelle manière ces inſectes recueillent cette matière ſur les fleurs, mais Mr. de Réaumur a vû les Abeilles ſe charger de leur pouſſière, et en former des pelottes, qu'elles appliquoient à leurs jambes poſtérieures.

Les jambes des Abeilles, ainſi que celles des Bourdons, ſont compoſées de pluſieurs parties, dont l'une, que Mr. de Réaumur appelle pallette, eſt platte, et parfaitement liſſe, mais entourée de poils; ces poils, courts et forts chez les Bourdons, et longs chez les Abeilles, ont fait donner à cette partie de la jambe le nom de corbeille. Dès que les Mouches-à-miel ſont arrivées ſur les fleurs où elles veulent faire des proviſions de cette eſpèce, elles ouvrent avec leurs dents les anthères des étamines, ces petites bourſes qui contiennent les pouſſières fécondantes; elles frottent leur ventre ſur la fleur, ramaſſent avec leurs jambes les pouſſières qui ſe ſont attachées aux poils de leur corps, les portent à leur bouche, forment de petites maſſes de cette matière, et les font paſſer de jambe en jambe, juſqu'à celle qui doit s'en charger; elles les preſſent alors dans leur corbeille à l'aide de leurs pattes, et un grand nombre de ces petites maſſes forment enfin une pelotte de pollen, de la groſſeur et de la forme d'un grain de poivre applati.

Les

Les Bourdons viennent de la campagne chargés de pelottes semblables, tantôt vertes tantôt jaunes, quelquefois noires d'autres fois blanches, et souvent de la grosseur d'un pois ordinaire.

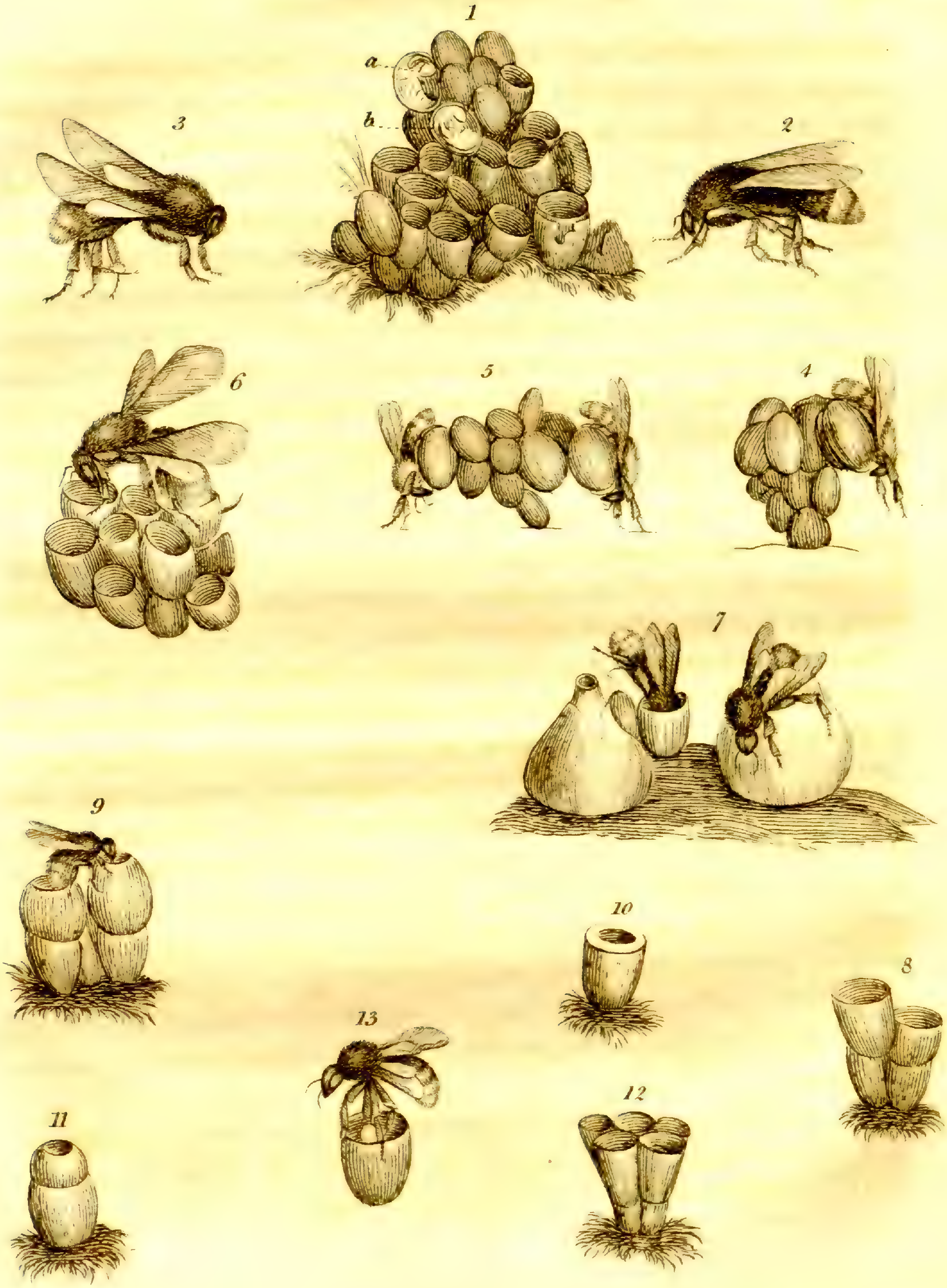
On voit souvent des Bourdons chargés de leurs pelottes. Tab. XXVII. Fig. 13. représente le Bourdon qui s'en décharge dans un des petits reservoirs dont j'ai parlé ; il monte sur ce pot, il cramponne ses jambes de la première paire sur le bord convexe de la coque ; il y fait entrer celles qui sont chargées de poussière, ainsi que celles de la seconde paire; il serre et presse les jambes chargées entre les deux autres ; celles-ci poussent en même tems les deux pelottes en avant ; ces pelottes glissent le long des jambes, et tombent dans le réservoir.

Le Bourdon retire alors ses pattes hors du pot ; il se retourne, et descend la tête la première dans le réservoir, il étend avec ses dents le pollen sur le fond du vaisseau, et y mêle quelquefois un peu de miel, qu'il a rapporté dans son estomac.

Les Bourdons destinent les nouvelles coques à leur servir de magazins : dès qu'elles sont vides ils abandonnent les anciennes, qui se trouvent au fond des gâteaux, parcequ'elles sont trop éloignées du lieu où ils se tiennent, c'est-à-dire, des gâteaux nouvellement construits, où ils soignent et rechauffent leurs petits ; peut-être aussi les negligent-ils, parcequ'elles sont plus exposées à la voracité de leurs ennemis: ils savent, cependant, encore en tirer parti; ils les effilent avec leurs dents, et en font un boure, ou une espèce de vouatte, dont ils recouvrent leur nid en guise de mousse. C'est peut-être par une suite du même instinct que ces insectes charpissent et cardent la toile que l'on met à leur portée, et qu'ils la font servir aux mêmes usages.

On voit donc, en général, que les Bourdons savent profiter de tous les avantages que la nature leur présente, et qu'ils savent faire servir les mêmes choses à des usages différens.

Monsieur


1
a
b
2
3
4
5
6
7
8
9
10
11
12
13

Monſieur de Réaumur croyoit que les jeunes Bourdons ſortoient de leurs coques de ſoie par en bas, ou par deſſous. Je ne comprends pas comment ils l'auroient fait, puiſqu'ils auroient toujours rencontré la terre, ou les gâteaux inférieurs; d'ailleurs, lorſqu'on retourne un gâteau ſens deſſus deſſous, les nymphes qui s'y trouvent enfermées deviennent noirâtres, et périſſent en peu de tems; mais de quel uſage auroient été toutes ces coques, lorſque les Bourdons en feroient ſortis par le bas? Ils n'auroient pas pû s'en ſervir pour y tenir leurs proviſions, ils auroient été obligés de conſtruire en cire un grand nombre de petits vaſes, ce qu'ils ne font que très rarement. Je ne ſais où cet obſervateur a pû fonder cette conjecture; toutes les coques que j'ai vû dans mes nids de Bourdons étoient ouvertes par le haut, et elles ne l'étoient en deſſous que lorſque les teignes, ou d'autres ennemis de ces inſectes, venoient dévorer les nymphes dans leur aſyle. Cependant, Monſieur de Réaumur a vû, ſans doute, les ouvertures de ces coques tournées en bas, car il l'a dit, et l'on ne peut douter de ſon exactitude. Il faut donc que ceux qui lui ont apporté des nids de Bourdons ayent renverſé leurs gâteaux; les ouvertures des coques auront été ainſi tournées en bas, et cet obſervateur aura pû prendre pour une diſpoſition néceſſaire, ce qui n'étoit qu'un effet du hazard.

CHAPITRE XI.

Des Mâles et des Femelles, et de leur Sort après la Fécondation.

LA Providence, qui laiſſe à certains animaux la liberté de ſe reproduire en toutes ſaiſons, ne détermine point celle de la génération de quelques eſpèces, mais fixe le laps de tems qui doit s'écouler entre

entre une portée et celle qui lui ſuccède, tandis qu'il en eſt pour qui les époques ſont déterminées, et que parmi quelques inſectes elle dirige encore l'ordre de la ponte. C'eſt ainſi que l'Abeille ne peut donner le jour aux mâles que dans une ſeule ſaiſon, quoiqu'elle ponde conſtamment des œufs d'ouvrières; qu'on ne voit point la Guêpe élever les males et les femelles avant l'automne; et que le Bourdon ne produit pas ſes femelles avant le tems où elles peuvent recevoir les ſoins multipliés qu'elles attendent des neutres.

Les femelles de Bourdons ne naiſſent pas dans toutes les eſpèces au même moment; les unes paroiſſent au mois de Juin, d'autres au mois de Juillet, et celles des Bourdons rouges et noirs ne ſe montrent ordinairement qu'au mois d'Août.

Les mâles naiſſent auſſi à différentes époques; on verra dans la ſuite la cauſe, ou du moins l'utilité, de cette diſpoſition.

Les femelles portent leurs œufs juſques au printems, et ne les pondent point dans le nid qu'elles habitent pendant le premier été. Il reſte à décider, dans quel lieu elles paſſent l'hiver, comment elles ſe préſervent des grands froids, omment elles ſe nourriſſent alors. Si elles ne prennent pas de nourriture, ſeroit-ce l'engourdiſſement qui les rendroit capables de s'en paſſer?

Ce ſont là autant de problêmes que Mr. de Réaumur avoit laiſſé à réſoudre; il imaginoit "que les femelles de Bourdons ſe retiroient "dans des trous de muraille, ou dans quelques cavités ſouterraines, "et qu'elles s'y engourdiſſoient pendant l'hiver, juſques à ce que le "ſoleil du mois de Mai eût rechauffé le terrein, et les eût rappellé "à la vie et à leurs occupations."

Une obſervation faite par un homme dont l'exactitude ne peut être miſe en doute, ſembloit confirmer cette conjecture. Le ſecrétaire de mon père avoit découvert un nid de Bourdons dans une prairie; il le viſita en automne, et il ne trouva plus d'ouvrières ni de mâles ſur les gâteaux; mais, en examinant la cavité, il apperçut une cellule creuſée

creusée en terre, et habitée par une seule femelle de Bourdon. Cette mouche n'étoit point encore engourdie ; elle prit le vol dès qu'elle apperçut le jour, et s'éloigna à perte de vue.

J'ai fait à ce sujet une observation, qui appuye encore l'opinion de Mr. de Réaumur, et qui nous apprend que les grandes femelles de Bourdons survivent seules à tous les individus dont leur famille est composée ; qu'elles se font un logement particulier auprès de leur nid, et qu'elles s'y enferment aux approches de l'arrière saison.

Le 21 Août je pris un nid de Bourdons de la sixième espèce ; quand j'eus ôté la mousse dont ils étoient entourés, j'enlevai les gâteaux ; ils paroissoient abandonnés les ouvrières et les mâles avoient disparu ; il y restoit seulement quelques femelles que j'enfermai avec leur nid dans une boëte faite exprès : en examinant plus attentivement la cavité souterraine, je découvris une autre loge, qui communiquoit avec la première par une gorge assez étroite ; j'enlevai délicatement le gazon qui la recouvroit ; je vis alors une grotte, ou plutôt une galerie, longue d'un pied au moins, et large de deux pouces et demi.

Je remarquai encore, que cette grotte étoit jonchée de mousse et de brins d'herbe, mais je n'y vis rien qui put servir d'aliment aux individus qui l'habitoient. Au moment où je soulevai le gazon qui lui servoit de toit, j'apperçus trente ou quarante femelles : je ne sais si elles furent alarmées du dégat que je fis dans leur retraite, ou de la lumière qui y pénétra, mais dès qu'elle fut découverte, toutes ces femelles prirent l'essort, quelques-unes s'éloignèrent beaucoup trop pour que je pusse les suivre : néanmoins, le plus grand nombre se précipita dans la cavité d'où les gâteaux avoient été tirés ; il me fut aisé de les saisir, et de m'assurer que c'étoient de jeunes femelles : si je ne les avois pas dérangées, elles se feroient engourdies dans la loge où elles étoient enfermées, elles y auroient passé l'hiver, et n'en seroient

ſorties que lorſque le ſoleil du printems leur auroit rendu la chaleur et le mouvement.

Les mâles et les mulets de Bourdons vivent moins de tems que les femelles, car ceux qui naiſſent au printems ou dans le courant de l'été périſſent tous dans l'automne de la même année ; mais les femelles qui naiſſent au mois d'Août, pour le plus tard, paſſent l'hiver à l'abri des injures de l'air, mênent une vie laborieuſe dès les premiers jours du printems, et meurent ordinairement à l'âge d'un an.

Les mâles et les ouvrières des Guêpes et des Frelons ne vivent qu'un été, comme ceux des Bourdons ; ils périſſent comme eux avant l'hiver ; les femelles ſeules ſurvivent : elles ſe tapiſſent à la fin de l'automne dans quelques trous, ou bien elles ſe mettent à l'abri ſous des tas de feuilles ſéches, et dans les paillaſſons de jardins ; les premiers froids les font tomber dans un engourdiſſement, qui dure tout l'hiver, et qui ne eſſe qu'au retour du printems.

Dès le mois de Mars on voit les femelles de Bourdons reparoître, et voltiger ſur les fleurs; c'eſt alors qu'elles commencent leur nid dans la ſolitude, mais on ne connoit leur hiſtoire qu'au mois de Juin : elles viſitent ſeulement au printems un grand nombre de trous, comme je l'ai dit ailleurs ; on peut croire qu'elles y cherchent un logement tel qu'il le faut pour établir leur famille.

CHAPITRE XI.

Sur les petites Femelles des Bourdons.

LA fécondité n'a point été accordée à tous les individus d'une ruche d'Abeille ; cette apparente caſtration, dont la nature ſemble être coupable, eſt peut-être un des chefs-d'œuvre du Créateur ; l'habilité

bilité des individus ſtériles ſemble ſi bien compenſer le défaut des organes de la génération, qu'on ne ſauroit dire leſquels ſont les plus utiles ; de ceux qui donnent le jour à toute la peuplade, ou de ceux qui logent, nourriſſent, ſoignent, et élèvent les petits.

Qu'arriveroit-il ſi toutes les Abeilles étoient reines, ſi toutes les Abeilles pouvoient pondre quinze à vingt mille œufs ? Telle eſt cependant la fécondité de cette mouche, qui entretient ſeule la population d'une ruche d'Abeille ; et la nature lui a refuſé non ſeulement l'art de conſtruire une cellule, mais celui d'élèver et de nourrir un ſeul des petits qu'elle pond chaque jour.

Ces inſectes ſont cependant du même ſexe ; le même œuf contient le germe d'une ouvrière et celui d'une reine ; et l'éducation du ver, c'eſt-à-dire, le genre de ſa nourriture, et la forme de ſon logement peuvent en faire un individu ſtérile, ou un inſecte dont les organes de la génération ſoient parfaits à tous égards ; elle peut même en faire un individu totalement dépourvu d'induſtrie, ou une mouche douée de l'art le plus étonnant que la nature ait confié aux inſectes.

Il eut été bien ſingulier, qu'entre les deux extrêmités de cette chaine, dont l'un des bouts eſt occupé par la fécondité, et l'autre par l'induſtrie, la nature n'eut mis aucun intermédiaire ; auſſi connoiſſons-nous chez les Abeilles deux ſortes de mouches, qui ſemblent tenir le milieu entre les reines et les ouvrières ; ce ſont les petites reines, et les ouvrières fécondes ; les premières avoient été apperçues par Needham ; leur exiſtence a été prouvée par pluſieurs obſervations de mon père. Ces inſectes, que l'on trouve rarement en vie dans les ruches, naiſſent dans des cellules royales auſſi grandes que celles des autres reines ; cependant, ils leur ſont beaucoup inférieurs par leur taille ; leur couleur, la forme de leurs machoires, et des articulations de leurs jambes, ſont autant des rapports qu'elles ont avec les Reines Abeilles ; autant de caractères qui les diſtinguent des ſimples ouvrières : on ne

les a jamais vû pondre, elles ont cependant des ovaires; voilà où ſe bornent nos connoiſſances rélativement aux mouches de cette ſorte.

Mais les individus qui ont plus de rapport avec les ouvrières qu'avec les reines, et qui cependant ſemblent tenir le milieu entr'elles, ces mouches qu'on appelle fécondes, ſont ſemblables aux ouvrières par leurs caractères extérieurs; même couleur, même taille, mêmes dents propres à ciſeler la cire, mêmes jambes capables de porter des pouſſières d'étamines; mais ſi elles ne ſont pas ſtériles, elles ne ſont que demi-fécondes; elles ne pondent jamais que des œufs de mâles.

On ne trouve de ces individus que dans les ruches qui ont perdu leur reine; la ponte de ces ouvrières entretient pour quelque tems l'intérêt et l'occupation dans la peuplade, qui ne tarderoit pas à périr ſans cela: tandis que les Abeilles ſont occupées à ſoigner et à nourrir les vers de mâles, elles ne ſongent point à déſerter leur ruche; mon père penſe auſſi que les mâles provenus de la ponte de ces ouvriéres ſont peut-être deſtinés à féconder les reines, qui ne ſe ſont transformées qu'après le maſſacre des faux Bourdons, parceque les mâles iſſus des ouvrières naiſſent ordinairement après cette époque. Chez les Bourdons, l'induſtrie n'a pas été accordée excluſivement aux mouches inféconde; au contraire, la femelle qui naît au mois d'Août, qui paſſe l'hiver en terre, et qui reparoit au printems, eſt la plus habile ouvrière dont ſa famille ſera compoſée; elle creuſe une cavité dans la terre, y conſtruit des cellules, nourrit et élève ſes petits dans la ſolitude; une ouvrière ſeule ne feroit point ſes travaux, ſa taille ſembleroit déjà s'y oppoſer; et d'ailleurs, on voit rarement une ouvrière iſolée s'occuper d'aucune eſpèce de travail.

La conformation des machoires de la femelle eſt entièrement ſemblable à celle des ouvrières; ſes jambes ſont également capables de ſe charger des pouſſières d'étamines, les couleurs des unes et des autres ſont pour l'ordinaire diſtribuées de la même manière ſur toutes les parties de leurs corps: il ſemble qu'à tant de rapports ſi l'on ajoute

celui

celui de la fécondité, on fera des ouvrières autant de petites femelles; car la différence de la taille eſt le ſeul caractère extérieur qui puiſſe les faire diſtinguer.

Or c'eſt ce que la nature a fait, mais les petites femelles chez les Bourdons diffèrent encore à d'autres égards des femelles en titre.

C'eſt au commencement du printems que les grandes femelles pondent les œufs qui doivent donner des ouvrières et des mâles, mais elles pondent plus tard ceux qui doivent donner des mères aux peuplades futures. Toutes les ouvrières qui naiſſent au printems ne ſont pas neutres, comme on l'a cru juſqu'à préſent; il en eſt de fécondes; on en voit pluſieurs dans chaque nid. Ces mouches font toutes les fonctions des mères; elles ſont quelquefois très petites, et à cauſe de cela le nom de petites femelles peut ſervir à les diſtinguer; elles ſont entourées dès leur naiſſance d'un petit nombre de mâles provenus des œufs de la mère commune; ces mâles les fécondent dès le mois de Juin; elles pondent bientôt après; et ce qui eſt bien remarquable, c'eſt qu'elles n'engendrent que des mâles, comme ces ouvrières que l'on obſerve quelquefois dans les ruches d'Abeilles, et qui ne pondent que des œufs de faux Bourdons. Mais ſi l'utilité de ces dernières eſt problématique, il ne paroit évident que les petites femelles des Bourdons ſont deſtinées à fournir un plus grand nombre de mâles aux jeunes et grandes femelles, puiſqu'après les avoir pondu et ſoigné, elles périſſent comme les ouvrières au commencement de l'automne.

Les mâles, auxquels elles donnent naiſſance, ſervent, comme je m'en ſuis aſſuré, à féconder les grandes femelles qui paroiſſent à la même époque, et qui ſans ce ſupplément auroient courru le riſque de ne plus trouver de mâles dans leur habitation, et de reſter infécondes.

Si l'on juge par analogie, l'on pourra conjecturer que c'eſt à l'eſpèce d'aliment qu'on prépare aux vers de Bourdons que ſont dues ces différences qu'on peut remarquer dans leur inſtinct.

Chez les Abeilles il a été prouvé par des expériences bien faites que des

des vers d'Abeilles communes étoient, à l'âge de trois jours, ſuſceptibles de devenir reines, s'ils étoient dès lors nourris avec de la bouillie royale, et s'ils étoient logés dans des cellules ſemblables à celles des reines.

L'on aura donc peu de peine à comprendre comment le même moyen peut être employé avec ſuccès chez les Bourdons, car les mœurs de leurs ouvrières ont bien du rapport avec celles de leurs femelles. De même l'on comprendra que ce moyen, employé avec quelques nuances, pourra faire de ces vers des vers de petites femelles.

C'eſt ici un des plus beaux traits de la puiſſance de la Nature, le fait eſt frappant chez les Abeilles; elle convertit à ſon gré des mouches ſtériles en des mouches fécondes, des inſectes inhabiles et mal-adroits en d'autres inſectes pleins d'adreſſe et d'induſtrie; mais quelle peine n'auroit-on pas attribuer à des cauſes en apparence éloignées, et ſi peu dignes d'attention, des effets auſſi ſinguliers, des effets auſſi frappans!

Cependant, il n'eſt pas impoſſible qu'un certain genre de nourriture puiſſe être plus favorable qu'un autre à l'accroiſſement et au perfectionnement des organes ſéxuels, et des membres d'un individu; mais comment concevoir qu'il puiſſe changer les paſſions, l'inſtinct et les mœurs d'inſectes originairement ſemblables? concevoir qu'une femelle deſtinée à jouïr de l'amour, à ſentir la jalouſie, à exercer ſa vengeance, à vivre dans l'oiſiveté,—que le germe de cette femelle, ou plutôt le fêtus d'un tel inſecte, puiſſe devenir celui d'une ouvrière zélée pour la défence commune, privée d'un plaiſir que la Nature n'a refuſé à aucun de ſes enfans, mais délivrée des peines de l'accouchement, laborieuſe, pleine d'adreſſe, habile à ſoigner les petits, à chercher du miel ſur les fleurs, capable de faire de la cire, de conſtruire des rayons dont les cellules hexagones ayent des fonds pyramidaux, de ſoigner les reines, dont elles auroient été les rivales ſi les organes de la génération euſſent été développés chez elles, et chargée de tuer dans un certain tems les mâles, qui n'auroient point alors excité ſa jalouſie?

Voilà une véritable métamorphofe. La chimie l'expliquera-t-elle? Nous apprendra-t-elle jamais, par quel fecret la différence des nourritures peut produire un changement fi complet dans l'inftinct, les goûts, et les habitudes de ces infectes? Il eft permis d'en douter; qu'ici donc la raifon et la philofophie nous fervent de flambeau.

Où feroient ces chefs-d'œuvres de l'architecture, ces colonnes, dont le fuft eft élevé fur les proportions de l'homme; ces ftatues qui repréfentent à l'efprit les actions des héros; ces monumens de la gloire, ces tableaux, dont les couleurs font illufion, et qui nous repréfentent les plus belles formes de la nature? Que deviendroit cette préférence de l'homme pour tout ce qui eft parfait dans fes proportions, dans fes contours, dans fes couleurs, fi cet être intelligent eût été privé de l'organe de la vue? fi dès fon origine l'homme n'eût connu que par fon toucher, par fon ouie, par l'effet des odeurs, et par la différence des faveurs? L'eût on vû découvrir de nouveaux mondes, mefurer les cieux, calculer la diftance, le poids refpectif et l'étendue des planettes, et découvrir enfin la loi du mouvement, celle de la gravitation, le fecret de l'univers? Voilà quels peuvent être les effets d'un fens, d'un organe, fur l'induftrie, et fur les habitudes de l'homme; ils n'ont pas moins d'influence en proportion fur l'inftinct des infectes; et quoique nous ne puiffions pas prouver que la Reine Abeille poffède plus ou moins de fens que l'Abeille commune, cela eft cependant vraifemblable; la nourriture et le logement font bien la caufe première de toutes les différences que l'on remarque dans leur inftinct; mais ils n'ont fait proprement que développer des organes de fens différens, et des membres plus ou moins, parfaits, dans des infectes originairement femblables; des fens nouveaux ont fait naître chez les uns des plaifirs et des befoins que les autres ne connoîtront point, les organes s'y font prêtés, les membres les ont fatisfaits.

Chez

Chez les autres peut-être de nouveaux ſens ont-ils produit cet inſtinct qui répond ſi bien à nôtre raiſon ? Il a exigé des travaux ; ces travaux ont été exécutés par les membres doués d'une adreſſe infinie, et c'eſt ainſi que tout ſemble être dirigé chez ces petits animaux.

La nature n'a pas eu un auſſi grand effort à faire avec les Bourdons; il y a bien moins de différence entre les mœurs des mères Bourdons, comparées à celles de leurs ouvrières, qu'entre l'inſtinct des Abeilles et celui de leurs reines.

Car, comme je l'ai dit, la mère d'une famille de Bourdons peut faire tous les ouvrages qui ſe font chez elles, et il n'en eſt pas de même dans les ruches d'Abeilles.

Ainſi la nature n'a eu que peu de peine à convertir des vers de femelles en vers d'ouvrières, et encore moins à en faire des petites femelles.

La ponte et les paſſions de ces petites femelles doivent attirer particulièrement nos regards ; voici de quelle manière je découvris leur fécondité, et les détails de leur ponte.

Je ne les diſtinguai point d'abord des ouvrières, tant elles leur reſſembloient par leurs caractères extérieurs, de ſorte que je fus très ſurpris lorſque je les vis pondre pour la première fois. Je tranſcrirai ici mon journal des derniers jours de Juillet, et des premiers du mois d'Aout.

Copie du Journal de Juillet 1796.

Le 26. Le vent a renverſé la cloche qui étoit ſur ma fenêtre, et le nid de Bourdons qu'elle renfermoit eſt tombé, avec tous les inſectes qui l'habitoient.

Les ouvrières ſont revenues à la place où étoit leur nid ; je leur ai donné une autre cloche, pour les garantir de la pluie ; je ne leur ai point

point rendu leur gâteau, qui étoit déjà rongé par les teignes depuis fort long tems.

La mère n'eſt point revenue, et je l'ai cherché vainement autour du gâteau.

Le 27. J'ai donné du miel aux Bourdons refugiés; ils commencent déjà à faire de la cire.

Le 28. Ils continuent à faire de la cire.

Le 29. Ils ont conſtruits un pot-à-miel ſur le bord de la carte où je mettois leur miel.

Le 30. Un des plus petits individus de la peuplade, à mon grand étonnement, vient de conſtruire une cellule de cire, où il a pondu deux œufs, en faiſant ſortir ſon aiguillon au travers de la cellule.

J'ai de la peine à le diſtinguer des autres, ſoit par la taille, ſoit par la couleur, ſoit par la forme de ſon corps; ſeulement ſon agitation ſemble plus grande, et il empêche les ouvrières de s'approcher de ſa cellule.

Cependant, il n'eſt pas toujours le plus fort, et d'autres montent ſur l'alvéole; ceux-ci ne cherchent point à enlever les œufs qui y ſont renfermés, ce qui eſt fort ſingulier; au contraire, ils les ſoignent avec plus de zèle que celui qui les a pondu, et les défendent auſſi contre les autres Bourdons.

Le 31. Seconde ponte du même Bourdon; mêmes circonſtances qu'hier.

1 Août. La petite femelle continue à pondre; elle bâtit toutes ſes cellules les unes à côté des autres.

Le 2. Continuation ſans aucune différence; je remarque ſeulement que les Bourdons n'ont point apporté ni préparé de pollen dans les cellules où vient de pondre la petite femelle.

Le 4. Les Bourdons ont apporté du pollen ſous la cloche; ils l'ont mis au fond d'un nouveau pot-à-miel; on les voit aller et

 venir

venir ſur le tas des cellules, et faire des creux en divers endroits, comme lorſqu'ils nourriſſent les vers. C'eſt qu'en effet quelques vers ſont éclos.

Le 5. Les Bourdons nourriſſent encore un peu les vers ; ils n'ont point apporté de pollen aujourd'hui.

Mon journal du onze m'apprend que ces vers périrent à défaut de nourriture, peut-être parceque les Bourdons s'étoient accoutumés à la ration de miel que je leur donnois chaque jour ; ils ne vouloient plus aller chercher leurs vivres à la campagne, en ſorte qu'ils negligeoient entièrement d'apporter la nourriture des vers ; j'y vois auſſi, que lorſque les Bourdons n'apportoient point de pollen, ils ne nourriſſoient point leurs petits, et que lorſque je leur en avois donné, ils leur en faiſoient part ſans balancer.

Je vis enfin le tas de cire diminuer chaque jour, et de nouveaux pots conſtruits à côté des premiers.

J'ignore ce que les Bourdons firent des petits vers ; il n'en reſtoit qu'un lorſque je leur enlevai la carte ſur laquelle ils avoient été pondus.

Mon journal du mois d'Août m'apprend qu'une autre petite femelle d'une eſpèce de Bourdon différente pondit auſſi dans ſon nid.

Mais je raconterai en détail ce qui s'y paſſa le ſeptième jour du même mois ; c'étoient des Bourdons rouges et noirs.

Le nid étoit fort peuplé ; il poſſédoit un bon nombre d'ouvrières, pluſieurs jeunes femelles de la grande taille nouvellement transformées, l'ancienne mère, et beaucoup de mâles.

Parmi les ouvrières il y avoit aſſurément des petites femelles, que j'aurois reconnues ſi j'avois ſçu leur trouver un caractère diſtinctif ; mais les ſcènes ſuivantes prouvèrent ce fait d'une manière indubitable.

Le

Le 7 du mois d'Août à minuit j'appercus une grande agitation dans le nid; il s'agiſſoit d'une ponte extraordinaire.

Pluſieurs Bourdons étoient occupés à faire une cellule de cire; cette cellule étoit bien moins grande que les alvéoles ordinaires, et ſes bords étoient bien moins élevés; ils y travailloient encore quand la femelle, mère de la peuplade, vint ſur la cellule, les chaſſa, et donna quelques coups de dents au bord de la petite coupe; elle fut contrainte de ſe retirer à cauſe de la fureur de quelques-uns d'entr'eux, qui s'approchèrent d'elle en battant des ailes, et qui la pourſuivirent juſques au bas du nid: ils achevèrent alors la cellule; et quand ils lui eurent donné les dimenſions convenables, je vis l'un d'entr'eux s'établir ſur l'alvéole, comme s'il eut eu l'intention de pondre: un autre y inſerra de même l'extrêmité de ſon corps; et tandis qu'ils étoient ainſi occupés à pondre conjointement, je vis revenir la vieille mère: le bruit et le battement de ſes ailes annonçoient d'avance ſa colère; elle ſe jetta ſur l'une des petites pondeuſes, lui monta ſur le dos, et réuſſit à la chaſſer à coups de dents: elle chaſſa l'autre de la même manière.

Dès que la cellule fut vacante elle y enfonça ſa tête, prit les œufs qui venoient d'être pondus, et parût les manger avec avidité.

Bientôt l'une des petites femelles revint ſur la cellule, lui rendit ſa première forme, et ſe mit à pondre: la vieille mère revint encore avec ſa jalouſie ordinaire, chaſſa la pondeuſe, et enfonça ſa tête dans la cellule: j'ignore ſi la petite pondeuſe crût avoir pondu, ou ſi elle n'apperçut pas le larcin de la vieille femelle, mais le fait eſt, qu'il ne reſta point d'œufs dans la cellule, et qu'elle la referma dès que la femelle ſe fut retiré: elle s'écarta pour chercher de la cire, et fermer plus ſoigneuſement ſa cellule; mais d'autres individus, qui étoient vraiſemblablement auſſi de petites femelles, vinrent auſſitôt, et lui rendirent ſa propre forme.

Je crus reconnoître alors cette petite pondeuse que j'avois pris sur le fait le 2 d'Août ; elle étoit la plus grande des petites femelles de ce nid là ; elle monta sur la cellule, élargit son orifice, éleva ses bords, se mit à pondre, et fit deux œufs devant moi. Peut-être en eut-elle fait d'avantage sur la vieille mère, qui revint en battant des ailes, la poussa hors de la cellule, la chassa bien loin, et finit par manger ses œufs. Celle-ci fut aidée dans ce travail par une des petites femelles dont j'ai parlé plus haut, et que j'avois marquée avec de la couleur lorsqu'elle étoit occupée à pondre dans la même cellule.

La petite femelle qui venoit de pondre reparut à son tour avec tous les signes de la colère; elle chassa toutes les ouvrières de dessus le gâteau, referma sa cellule quoique vide, et fit la garde autour d'elle avec une activité étonnante : elle se coucha sur son ouvrage ; et quand je la vis bien resolue à ne plus pondre, je l'enlevai avec la vieille mère, et je les enfermai dans un poudrier pour savoir si tous les Bourdons qui se mettroient sur ces cellules étoient de véritables pondeuses : mais je ne pûs pas m'en assurer, parceque les ouvrières détruisirent cet cellule; et comme il étoit trois heures du matin, je me retirai, et je renvoyai au lendemain la suite de mes observations.

A six heures du matin il ne restoit plus de vestige de la cellule, et je rendis à leur nid les deux individus que j'avois fait prisonniers: ce jour là, à six heures du soir, l'agitation recommença ; une large et épaisse cellule se faisoit remarquer sur les gâteaux; la vieille mère, qui ne pondoit plus depuis fort long tems, et qui étoit devenue stérile à force de pondre, étoit montée sur la cellule ; elle en déchiroit les bords avec acharnement, sans avoir pour but d'enlever les œufs qu'elle pouvoit contenir, car elle étoit ouverte, et d'ailleurs elle n'en contenoit pas un.

C'étoit donc par jalousie, et non pas par besoin.

Il m'importoit de ſavoir ſi les œufs de ces petites femelles viendroient à bien; et pour ſatisfaire ma curioſité, j'enlevai pour la ſeconde fois la vieille femelle, et j'obſervai encore les manœuvres des individus qui reſtoient dans le nid.

L'agitation monta à ſon comble.

Les petites femelles ſe pourſuivoient les unes les autres; trois ou quatre d'entr'elles vouloient pondre à la fois: elles ſe diſputoient la cellule avec une rage étonnante: celle qui parvenoit à la poſſéder un inſtant pondoit quelques œufs, et devenoit l'objet de la jalouſie des autres; celles-ci ſe jettoient ſur elle, harceloient le bout de ſon ventre, et la faiſoient enfin déguerpir à coups de dents.

La plus groſſe d'entr'elles parvenoit toujours à s'emparer de la cellule; mais elle n'en pouvoit jouir que foiblement, car les autres s'acharnoient à l'en chaſſer; et comme elle ſe ſentoit la plus forte, elle ſe retournoit, et les précipitoit au bas du gâteau avec la rage des vieilles mères: quand elle avoit pondu, elle étoit obligée de garder ſa cellule—plutôt peut-être par jalouſie que par amour pour ſes petits.

Cette ſuite d'obſervations fut dérangée cette année là par les teignes; elles mangèrent les cellules où les petites femelles avoient pondu, et je ne pus ſavoir de quel ſexe auroient été les individus qui en ſeroient ſortis, mais depuis lors j'ai mis tous mes ſoins à le découvrir.

Dès le 21 de Juin de l'année 1797 les petites femelles m'offrirent les mêmes ſcènes: elles furent quelquefois encore plus animées; le 22 j'enlevai la mère; le 23 je la replaçai dans ſon nid; elle paroiſſoit robuſte et bien portante, mais un quart d'heure après je la trouvai expirante ſous le gâteau. Ses rivales continuèrent à pondre pendant plus d'un mois. Le 26 de Juin de petits vers naquirent dans une cellule où elles avoient pondus le 21. Le 4 Juillet ces vers

filèrent

filèrent leurs coques; le 6 ces coques changèrent de forme; le 18 leurs habitans les ouvrirent pour en ſortir; je les obſervai avec ſoin, et je les reconnus tous pour des mâles.

Les grandes et jeunes femelles ne ſe mêloient pas aux ſcènes ſingulières dont on a parlé, et n'étoient point en butte à la jalouſie des petites femelles. Tandis que la mère commune en étoit quelquefois la victime, la nature, en privant les jeunes femelles de la faculté de pondre dans le nid où elles étoient nées, les ſouſtrayoit à la fureur toujours dangereuſe de leurs rivales; et c'étoit peut-être à cette ſeule précaution qu'étoit attachée la conſervation de l'eſpèce.

Les mâles de la dernière ponte fécondoient les grandes femelles pendant ce premier période de leur vie: celles-ci deſtinées à fonder de nouvelles colonies n'étoient cependant pas inutiles à celles qu'elles habitoient encore; elles travailloient comme de ſimples ouvrières dans le nid où elles avoient pris naiſſance; elles s'occupoient comme elles à recolter le miel et le pollen; je les ai vues chargées de pelottes à leurs jambes, vuider dans les pots-à-miel celui qu'elles avoient recueilli ſur les fleurs; elles faiſoient de la cire, elles ſavoient la ſculpter, elles devoient même ſavoir conſtruire des cellules quand elles auroient à commencer de nouveaux nids; mais avant ce terme elles ne faiſoient jamais d'alvéoles.

Elles paroiſſent donc ignorer l'art de bâtir, et cette faculté reſte ſuſpendue juſques au retour du printems: à cette époque le ſentiment de leur maternité leur rend tout leur inſtinct, et reveille en même tems chez ces jeunes mères l'idée des œufs qu'elles ont à pondre, et celle des cellules dans leſquelles ils doivent être dépoſés.

Si les ouvrières conſtruiſent quelquefois des cellules, ce n'eſt que lorſqu'elles ont été commencées par la mère commune, ou par de petites femelles; elles ne les conſtruiroient peut-être jamais d'elles-mêmes.

CHAPITRE XIII.

Conjectures.

ME permettra-t-on de hazarder quelques conjectures ſur l'origine des gâteaux, ſur la formation des premières cellules, et ſur les premiers travaux de la femelle lorſqu'elle eſt encore ſeule à l'ouvrage?

Si l'on doit croire que la Nature ait donné aux inſectes des loix uniformes pour diriger leur conduite, je pourrois ſuivre l'analogie ſans trop m'écarter de la vraiſemblance.

La Nature ſemble déjà avoir tracé une ligne qu'il ne faut que continuer pour arriver à la vérité; un plan qu'il n'y a qu'à ſuivre, et ce plan on vient de le lire dans les obſervations précédentes.

La mère Bourdon, après avoir creuſé d'une manière quelconque la cavité dans laquelle elle a poſé les fondemens de ſon nid, aura amaſſé dans le fond du creux une aſſez grande quantité de cire pour former une cellule; car elle a, comme je l'ai dit, la faculté de produire cette matière en plus grande abondance que les ouvrières; elle aura façonné cette petite maſſe en forme de coupe; elle aura été ſur les fleurs chercher des pouſſières d'étamines; elle les aura placées dans le fond de l'alvéole, et ce ſera le premier aliment de ſes petits.

Ce n'eſt qu'après ces préliminaires qu'elle y aura dépoſé ſes œufs; ſelon ſon uſage, elle en aura pondu ſept ou huit à l'aide de ſon aiguillon; et pendant ſon travail elle n'aura point été inquiète pour leur ſureté, puiſqu'ils n'auront pas été expoſés à la voracité des autres Bourdons.

Des vers ſeront éclos; ils ſe ſeront nourris des proviſions qu'on avoit préparé dans leurs cellules; ils les auront bientôt conſommées; leur corps aura pû prendre de plus grandes dimenſions avant de remplir le vide cauſé par la diminution du pollen; et leurs forces s'étant accrues avec leur grandeur, ils auront fait éclater la pellicule de cire qui les enfermoit.

La

La femelle aura pris quelques brins de cette matière ſur la ſurface de l'alvéole, et aura joint, au moyen d'une bande de cette ſubſtance, les deux hémiſphères creux dans leſquels la cellule aura été transformée.

Le logement des vers aura donc été augmenté au moyen de l'effort qu'ils auront fait pour le rompre, et par les ſoins de leur mère.

Elle doit alors avoir été obligée de les nourrir chaque jour, car ils ne devoient plus avoir de pollen dans leur magazin. Ces petits ayant pris tout leur accroiſſement, chacun d'eux ſe ſera conſtruit ſous la cire un logement à part, dont les lambris auront été de tentures de ſoie.

La mère aura peut-être alors réuni la cire qui couvroit les nouvelles loges de ſes petits, et l'aura ſculptée en cellule pour y pondre de nouveaux œufs.

Mais remarquons déjà que voilà un gâteau tout formé; les loges de ſoie, qui d'abord étoient applaties, ſe ſeront redreſſées, et auront pris la forme d'un œuf, et les petits qu'elles renferment à cette époque auront ſubi toutes leur métamorphoſes.

C'eſt dans cet état que j'ai trouvé au mois de Juin un petit gâteau de Bourdon dans une cavité ſouterraine; ce nid n'étoit habité que par trois individus parfaits, une mère et deux ouvrières.

Ce gâteau n'étoit compoſé que de huit coques réunies; les deux coques qui occupoient le milieu étoient ouvertes, les ſix autres étoient encore fermées; on voyoit ſur ſes bords deux maſſes de cire qui contenoient des œufs.

Ce gâteau entre parfaitement dans le plan que je viens de crayonner; il eſt d'accord en tout avec les idées que j'ai données pour des conjectures; il ſemble prouver que je ne me ſuis point écarté de la vraiſemblance.

On conçoit facilement que de nouvelles cellules conſtruites ſur les premières coques donneront lieu à de nouveaux gâteaux, et que les premières

premières coques ouvertes serviront aussi les premiers de pots-à-miel à la famille.

Voilà donc la femelle en société, et le lecteur exactement au point d'où il étoit parti. La route que je lui ai fait parcourir conjecturalement me paroit assez naturelle pour l'adopter, en attendant que de nouvelles observations nous apprennent si c'est là réellement la marche de la Nature.

La scène change quand les premières mouches sont transformées; la mère, qui avoit vécu jusqu'alors dans une solitude profonde, se voit entourée de mouches industrieuses auxquelles elle a donné la vie. Elle n'est plus obligée d'aller aux champs pour recolter le miel et le pollen; elle est dispensée de ces courses toujours dangéreuses; ses enfans adultes se chargent aussi de la nourriture des vers, de la cloture et de la défense du nid; et s'ils lui laissent le soin de perpétuer l'espèce, ils l'aident encore à construire et à perfectionner les berceaux de ses petits.

L'été offre des tableaux plus piquans à l'observateur. Le privilège de pondre n'appartient plus exclusivement à la mère commune; un peuple de petites femelles paroit alors; elles lui disputent ce droit qu'elles partagent avec elle. Elles se chassent les unes les autres, se combattent souvent, se tuent quelquefois, et donnent le jour à un grand nombre de mâles.

Ceux-ci fécondent les grandes femelles qui naissent à la même époque, et les dehors du nid sont le théâtre de leurs amours. Lorsqu'ils ont assuré la conservation de l'espèce, ils périssent, et l'automne voit aussi disparoître la vieille mère, les ouvrières, et les petites femelles.

Les jeunes femelles de la grande taille survivent seules à toute la peuplade, mais elles s'enferment dans un tombeau qu'elles ont creusé dans l'arrière saison; les premiers froids les engourdissent;

elles bravent dans cet état les rigueurs de l'hiver; elles ne ſortent de leur léthargie qu'au retour du printems, et lorſqu'elles peuvent trouver ſur les fleurs le miel et le pollen qui ſervent à les nourrir. Elles ne ſentent donc les beſoins que lorſqu'elles peuvent les ſatisfaire, et ce dernier trait n'eſt pas le moins intéreſſant de leur hiſtoire.

XX. *Bota-*

XX. *Botanical Characters of four New-Holland Plants, of the Natural Order of Myrti.*

By James Edward Smith, M.D. F.R.S. P.L.S.

Read July 7, 1801.

SINCE the publication of a paper in the third volume of the Linnean Society's Tranſactions, the aim of which was to fix the botanical characters of ſeveral genera and ſpecies of the natural order of MYRTI, hitherto not well determined; I have become acquainted with a few more of the ſame tribe, four of which it is my deſign to deſcribe at preſent. The number might appear too inconſiderable to be the ſubject of a paper, nor ſhould I, ſcarcely, have offered them in this form to the Society, were it not as a kind of neceſſary ſupplement to the former treatiſe; and had I not a few particular obſervations to propoſe reſpecting one of the plants.

3. * LEPTOSPERMUM *grandifolium*, foliis lanceolatis mucronatis ſubquinquenervibus ſubtùs pubeſcentibus, calycibus villoſis: dentibus membranaceis coloratis.

A ſingle ſpecimen of this new ſpecies of *Leptoſpermum*, gathered by Dr. White in New South Wales, has been communicated to me by A. B. Lambert, Eſq. It is much larger than any other I have ſeen of the genus, eſpecially the leaves, which are above an inch long, and near a quarter of an inch broad. Their form is lanceolate, tapering more towards the baſe than towards the extremity, and they are tipped with a ſmall prominent, ſharp point; their margin is en-

tire, a little revolute; upper furface fmooth and fhining; lower paler, opake, downy, punctate, marked with two obfolete longitudinal ribs on each fide of the principal one. Flowers terminating the fhort lateral branches, folitary, feffile, furrounded with a few leaves; white, large and handfome. Calyx clothed all over with white filky down; its teeth membranous, whitifh, lefs filky on the infide, moft fo externally about the tip. The germen is found to confift of only five cells; otherwife the appearance of the plant, and large fize of all its parts, would have led me to fuppofe it a *Fabricia*, nearly allied to Gærtner's *myrtifolia*. As a *Leptofpermum* it fhould be inferted between the third and fourth fpecies, being next akin to the *lanigerum*.

5. * L. *imbricatum*, foliis obovatis imbricatis enervibus, ramulis calycibufque glabris; dentibus membranaceis coloratis carinatis.

Gathered near Port Jackfon, New South Wales, by the late Mr. David Burton, and communicated to me by the Rt. Hon. Sir Jofeph Banks. It is clofely allied to the fifth fpecies, *L. parvifolium*, but differs at firft fight in the imbricated appearance of its numerous leaves on the long lateral branches; and the flowers will be found on examination totally diftinct, being not half the fize of thofe of *L. parvifolium*, ftanding two or three together about the extremity of each branch, not folitarily: their calyx moreover is in every part perfectly fmooth, and its teeth fharply carinated, which in the other are only a little convex, and entirely deftitute of any keel.

4. * MELALEUCA *fquarrofa*, foliis fparfis oppofitisve ovatis muticis quinquenervibus, floribus lateralibus, dentibus calycinis lævibus.

M. fquarrofa. *Donn. Hort. Cant. ed.* 2. 101.

I am

I am indebted to the Rev. Mr. Davies, F. L. S. Vice-Maſter of Trinity College, Cambridge, for ſpecimens of this ſhrub, which was raiſed in the Botanic Garden of the Univerſity by Mr. Donn, from ſeeds brought from Port Jackſon, and flowered in 1799. It ſhould ſtand next to the *M. ſtypheloides*, to which its leaves bear ſome reſemblance; but they are neither twiſted nor pungent, neither have they more than five, or at moſt ſeven ribs; they are alſo more inclined to be oppoſite than in that ſpecies. The flowers are white, encircling the branches in longiſh cluſters. Calyx-teeth blunt and without nerves, as in moſt of the other ſpecies, and totally unlike the ribbed acuminated teeth of *M. ſtypheloides*. Stamina collected together into bundles, but imperfectly, and never to any conſiderable diſtance from their baſe, ſo that it would ſcarcely be taken for a *Melaleuca* till the filaments in decay are found to fall off (for the moſt part) in cluſters. The ſtigma is ſimple, as in *Metroſideros*.

The very imperfect connection of the ſtamina in this plant leads us to remark how little the diſtinction between *Melaleuca* and *Metroſideros*, and conſequently even the character of the Linnean claſs *Polyadelphia*, are founded in nature. Moſt plants indeed, of that claſs, like moſt ſpecies of *Melaleuca*, have the filaments ſo ſtrictly united, for a conſiderable part of their length, into ſeveral (moſtly three or five) *phalanges* or bundles, and thoſe bundles fall off ſo entire, that the character derived from ſuch a circumſtance ſeems no leſs natural than convenient for the ſyſtematic botaniſt. In the *Melaleuca nodoſa*, on the contrary, the union of the ſtamina is continued but a little way from the baſe, and it is even more ſlight in the plant now before us, many of the filaments being quite ſimple, and unconnected with their neighbours. The caſe is the ſame in the genus *Citrus*, of which Linnæus could not but be aware when he eſtabliſhed this claſs, and indeed he alludes to the variableneſs of the character in his *Genera Plantarum* in deſcribing *Citrus*. Neither is this

this character, ſlight as it is, connected with any peculiarity of habit by which a *Melaleuca* can be known from a *Metroſideros*; nor, I believe, would any botaniſt venture to gueſs at a *Melaleuca* without ſeeing the ſtamina, in which the only peculiarity of the genus reſides. What then is to be done, when even this peculiarity ſeems eluding our graſp? We can only retain the genus as an artificial one, along with many other ſuch, till the ſcience be arrived at a greater degree of perfection; keeping, in the mean time, *natural orders* in view as the grand object of our ſyſtematic inquiries, and cheriſhing every truly *natural genus* as a fixed point, on which we may found the principles of future diſcoveries.

1. * EUCALYPTUS *marginata*, operculo conico magnitudine calycis, umbellis lateralibus, foliis ovatis margine incraſſatis.
E. marginata. *Donn. Hort. Cant. ed.* 2. 101.?

Mr. Aiton favoured me with ſpecimens of this plant three years ago from Kew Garden. The ſeeds were brought from Port Jackſon. Its leaves agree very much in form with thoſe of *E. robuſta*, (next to which it ought to be placed,) but the footſtalks are ſhorter, veins more prominent, and the margin more thickened, ſomewhat cartilaginous, and reddiſh. The umbels are ſolitary, axillary, and ſimple. Flowers ſcarcely one-third of the ſize of the *robuſta*, and their covers are neither broader than the calyx, nor longer; neither are they contracted in their middle. The flowers much reſemble thoſe of my *E. pilularis*, but the leaves are totally different.

XXI. *Additional Obſervations on ſome remarkable Strata of Flint in the Iſle of Wight, in a Letter from Sir Henry Charles Englefield, Bart. F.R.S. to John Latham, M.D. F.R.S. and L.S. of Romſey.*

Read July 7, 1801.

DEAR SIR,

I FEEL much flattered by the notice taken of my Paper* on the Chalk Pits of the Iſle of Wight by the Linnean Society; and as I wiſh to render my account of the very curious appearances obſerved by me in them as perfect as I can, the following additional obſervations on the ſubject, made during a ſecond viſit laſt year, are, by your favour, ſubmitted to the Society.

The pits I laſt year inſpected are as follow, beginning from the eaſt.

Brading pit, which is at the eaſtern point of the great ridge, where the valley of Brading Haven interſects it, and ſeparates it from the Yaverland hill, which terminates in the ſea at Culver and Bembridge.

A road cut into the chalk above Knighton.

Aſhey-down pit, about three miles eaſt of Newport.

A pit very near to, and ſouth of, Cariſbrook caſtle.

The cliffs and caves of Freſhwater bay, both eaſt and weſt of the valley, which interſects them entirely, and runs from Freſhwater to Yarmouth.

The Yaverland chalk is, therefore, the only part which I have

* P. 103.

not examined, and little doubt can be entertained of its ſimilarity to the reſt of the range, to which it evidently belongs.

In Brading pit ſome flints appear in detached nodules, and theſe are ſound and unbroken.

The inclined ſtrata of flint are viſible, but not to advantage, owing to the manner of working the pit. In theſe ſtrata the flints are univerſally ſhattered, ſome into abſolute powder, others into groſſer powder and fragments mixed. But beſides theſe ſtrata, the chalk in this pit is divided by vaſt perpendicular fiſſures, as ſmooth as plaiſter walls, and in ſome of theſe fiſſures flint has formed, which appears broken like that in the ſtrata.

The road above Knighton only juſt cuts into the chalk ſtratum, but all the flints viſible in the banks are extremely ſhattered.

The pit at the weſt end of Aſhey-down, near two large barrows, is the moſt extenſive and ſatisfactory of any I have ſeen. The perpendicular face of the chalk, where worked, is not leſs than fifty or ſixty feet, and its direction is at right angles to that of the ſtrata, and parallel to their line of dip:—of courſe, they are ſeen to very great advantage. The ſtrata ſeem to dip northward more rapidly than in any other place where I could obſerve them. The angle of inclination is from 75 to 80 degrees. There are not layers of flint between every layer of the chalk. Some of the chalk is peculiarly ſolid, and riſes in very large maſſes, affecting a cubic form. Their ſolid vein is from twenty-five to thirty feet thick, and is in ſtrata from three to four feet. In all this ſolid part there are very few flints.

Both above and below this harder bed (ſpeaking of the original poſition of the ſtrata) the chalk is ſofter, and has more flints in it. The ſtratified flints in this pit are full as much ſhattered as any I

6 had

had seen. The nodules are not at all broken. Many of the stratified flints are much defaced in this pit by an admixture of pyrites, so as to be quite opaque, like a coarse jasper; and these flints are much softer than the others, as is always the case in the impure flint.

In the chalkpit near Carisbrook the strata are not so visible as in the pit north of the castle, (described in the first paper,) but the flints are to the full as finely, though perhaps not so generally, broken. In one flint I observed, that though it lay in its bed undisturbed, chalk, as if in a fluid state, had run into one of the fissures. Every appearance in this pit indicates that the chalk, since its stratification, has received a most violent shock.

The chalk at Freshwater bay appears in high perpendicular cliffs, particularly on the western side of the bay. Both on the east and west the strata dip northward near 80 degrees, and the dip seems to run east and west very regularly. The western cliff has a very regular and perpendicular face to the eastward; and here the parallel direction of the strata, each separated by a thin line of black flint, presents a most curious appearance. The flint here is often found in thin plates of considerable extent, sometimes not above an inch thick, and seems formed from each side of the space which it fills; as the exterior parts (or those nearest the chalk) are the purest and blackest, and it is gradually whiter towards the middle, where there is often a line of soft chalk included between the two plates of flint. All the stratified flints are more or less shattered, and some are reduced to very fine powder. The cave at Freshwater, which is really a beautiful as well as a curious one, is formed by the action of the sea on these nearly vertical strata. They are of different hardness, and all intersected with fissures at right angles to the strata. When the sea acts on and wears away a soft stratum, a gallery is formed, and

the upper parts of the ftratum between fiffure and fiffure drop out, much in the fame way as bricks are apt to do out of the flat arch over a window; the harder contiguous ftrata ferve as walls to the gallery, but are by degrees perforated in different parts, and become irregular pillars, fupporting the vaft weight of the hill above, until the action of the fea weakens them fo far, that they fall, and a part of the face of the hill goes with them: fo that the cave is conftantly, although flowly, changing its form.

Large maffes of the harder ftrata, defended by their flint coating, alfo ftand up in the bay as infulated rocks of different fhapes, and much refembling the Needle rocks, which are exactly of the fame materials, and formed by the fame procefs. In this part of the chalk ftratum I faw feveral foffil remains, which I had fought in vain in the pits I had vifited. One was fingular. It had the appearance of part of a very large fhell, regularly ftriated, and almoft flat. I have often feen fmall fragments apparently of a fimilar fhell, in chalk, but never a large piece. It was fo firmly fixed as not to be removed without a chifel; which I had not.

To thefe obfervations on the chalk of the ifland I muft add, that this whole range, although really chalk, is much harder than the chalk of the South downs; infomuch that the carpenters cannot ufe it for drawing lines, but import chalk for that purpofe from Portfdown hill, above Portfmouth. They alfo call the ifland chalk by the name of marle, which is, however, only the Breton name for chalk, and appears in many compound names, fuch as *Marl-borough* on the Wiltfhire chalk hills, and the very fignificant one of *Albemarle*, or white chalk.

As I made fome further obfervations on the fouthern range of hills which form the back of the ifland, I will trefpafs on your patience a little longer, particularly as they in fome degree contradict,

or

or rather correct, what I had advanced on that subject in my former letter.

When the northern front of those hills is viewed from Ashey down, the stratum of stone mentioned in my former letter, as lying directly under the chalk of St. Catharine's and Dunnose hills, appears every where to maintain an horizontal position; and so in its general disposition, particularly in its northern front, it certainly does; but just behind the village of Ventnor, the stratum entirely disappears, as if it had been ingulphed in a great chasm; and a deep and narrow valley runs winding into the chalk hill of St. Boniface, though it does not penetrate through it, which seems the remains of the fissure into which the stone had sunk.

The appearances of the great stone stratum, from Niton eastward to Ventnor, are noted as follows in the journal made on the spot:

On an attentive inspection of the strata of the under cliff, it appears that the great stratum of rugged and laminated stone, which first appears at the west side of St. Catharine's, and, thence ranging eastward, forms the front of the cliffs overhanging the Underway, dips in its southern face gently to the eastward. The cliffs at Mirables are much higher above the sea than those of St. Laurence; and from thence they decline till at the opening in the hill above Ventnor they totally disappear. A small crag just peeps out of the eastern face of this dell, and the whole hill of St. Boniface is, as far as can be seen, composed of chalk. As, however, this, like all other chalk hills, is in the state of a steep slope covered with turf, perhaps by digging into its face the stony stratum might be discovered. It is also to be observed, that the chalk, which is not visible above the rock at Mirables, begins to appear soon after, and grows gradually thicker as it proceeds eastward. At St. Laurence, it forms a thick cap to the rocks; and at Steephill shute its thick-

 ness,

nefs is very much increafed, and foon after nothing but chalk appears in St. Boniface's hill. In what form the rock re-appears at Dunnofe to the eaft of St. Boniface, I have had no opportunity of examining.

I fhould not, dear Sir, trouble you with thefe defective obfervations, but that every notice, however imperfect, may be of ufe when connected by future obfervations, and that they may ferve as a ftimulus to other travellers who often go over this beautiful line of country, to turn their attention to its fingular natural phænomena.

I fend you two fpecimens of the broken flints; one from above Brading, the other from near Carifbrook; but the tickets are miflaid, and I am not fure which is which.

I remain, &c.

Tilney Street,
May 26, 1801.

XXII. *Defcrip-*

XXII. *Description of a new Species of Viola. By Thomas Furly Forster, Esq. F. L. S.*

Read July 7, 1801.

VIOLA CONCOLOR.

VIOLA caulibus erectis, foliis lato-lanceolatis stipulisque lanceolato-linearibus integerrimis;

Habitat in uliginosis Americæ Septentrionalis. ♃

DESCRIPTIO.

Radix fibrosa, ramosa, alba, perennis.

Caulis herbaceus, erectus, flexuosus, sulcato-angulosus, simplex, hispidus, pedalis et ultra.

Folia alterna, lato-lanceolata, acuminata, integerrima, rugosa, ciliata, dilute virentia; variant sæpe argute dentata aut lacera.

Petiolus brevissimus, semiteres.

Stipulæ quatuor; duæ majores, duæ minores; lineari-lanceolatæ, arcuatæ, integræ, ciliatæ.

Pedunculi duo, minimi, ex axillis foliorum; unus ferens florem abortivum.

Bracteæ duæ, minimæ, lineares, obtusæ.

Flores

Flores parvi, dilute virides, plantæ concolores.

Calyx: *Perianthium* pentaphyllum, concavum, hamosum.

Corolla: Petala quinque viridia:

duo *superiora* minima, linearia, recurva, integra;

duo *lateralia* linearia, dentata, recurva;

infimum bipartitum.

Calcar brevissimum, obtusum.

Stamina quinque, subulata, brevissima.

Antheræ viridi-purpureæ, basi bifidæ.

Pistillum breve.

Stigma non urceolatum, sed hamosum, perforatum, duplo longius antherâ.

OBSERVATIONES.

Culta rarissime floret. In horto meo jam annos plus quatuordecim exstitit; at cum sæpius ex America repetita esset, bis solummodo, primum duntaxat anno, hoc tanto temporis spatio floruit. Nusquam alias virescentem nisi in Horto Regio Kewensi vidi. Specimen siccum inde decerptum in Herbario egregio Dom. Jos. Banks, Bart. exstat, sed nondum in aliquo (quod sciam) de hac re scriptore hæc species notata est; nec pro certo habeo quod vere sit Viola, forsan cum multis aliis sub novo genere melius distinguenda.

Cum omne hoc genus (Violam) semper magno studio excoluerim, species haud minus sexaginta notavi; et cum per otium licebit, libenter genus, nunc plurimis mendis laborans, expedire conabor. Duas tantum observationes speciminis loco huc afferam.

Viola lanceolata Gmelin ex Siberia descripta non est eadem quam sub eodem nomine Kalm ex Canada proposuit. Hæc foliis peranguftis lanceolatis nitidis, radice fibrosa, stolonifera; illa foliis ovato-lanceolatis pubescentibus, radice fusiformi, acaulis.

Viola concolor

Viola grandiflora hortorum non eſt eadem quæ *Viola grandiflora* Linnæi, ſed omnino ſpecies nova, cui *Violæ Pallaſii* nomen dare velim, ut a Pallas primo in Siberia inventæ.

EXPLICATIO TAB. XXVIII.

Fig. 1. Planta magnitudine naturali.
2. Calyx.
3. Petala ſuprema.
4. Petala lateralia.
5. Petalum infimum.
6. Stamen.
7. Piſtillum.
8. Antheræ.
9. Anthera.
10. Capſula.
11. Semen.

XXIII. *Description of the Fruit of Cycas revoluta. By James Edward Smith, M.D. F.R.S. P.L.S.*

Read November 3, 1801.

THE *Cycas revoluta, Thunb. Fl. Japon.* 229, *Ait. Hort. Kew. v.* 3. 475, having, for the firſt time in England, produced fruit in the collection of the Honourable and Right Reverend the Biſhop of Wincheſter, at Farnham Caſtle, Surrey; his Lordſhip was pleaſed to requeſt that an account of it might be laid before the Linnean Society. For this purpoſe I was induced to go to Farnham in November 1799, accompanied by Mr. Sowerby, in order to make the requiſite obſervations. We found the fruit then ripe, and exhibiting a moſt magnificent ſpectacle. The plant was much larger than any I had ſeen of the ſame ſpecies, and ſeems to be one of the oldeſt in England. We learn from the *Hortus Kewenſis* that this *Cycas* has been about 40 years in our collections. It is not known that the Farnham plant was larger at its firſt introduction than ſuch as are uſually brought from abroad, perhaps 2 or 3 feet in the diameter of the circle formed by the expanded leaves; that diameter is now 10 or 12 feet. Suppoſing it therefore to have been one of the very firſt introduced, it has grown much more rapidly than uſual; for there are few to be ſeen in England, even the oldeſt, that are half ſo large. I ſhall proceed to deſcribe its appearance and ſtructure.

The ſtem is about 2 feet in height, and 9 or 10 inches in diameter. Thunberg deſcribes the ſame as riſing in Japan to the height of 6 feet or more, with nearly the abovementioned diameter. Its ſurface is brown, and very ſcaly with the remains of old leaf-

ſtalks.

ſtalks. A ſimple circle of about 40 evergreen pinnate leaves crowns the ſummit, forming a magnificent baſon, whoſe margin meaſures 10 or 12 feet acroſs, and 5 or 6 feet in height above the level of the bark bed of the ſtove. On mounting a ladder we beheld in the bottom of this verdant and ſhining amphitheatre a circular cluſter, perhaps 18 inches wide, of above an hundred orange-coloured downy oval fruits, intermingled with innumerable palmate, pale brown, thick and woolly leaves or fronds, each of whoſe finger-like ſegments was tipped with a ſharp ſpine. With reſpect to its earlier ſtate, the Biſhop has informed me, that on his arrival at Farnham early in September, the gardener informed his lordſhip the *Cycas* "had borne a ſingular appearance during ſummer." On inſpection, the crown of the plant was found occupied by the abovementioned woolly leaves, then beautifully laciniated though not ſpinous, and having the appearance of a *ſtrobilus* or cone, hollow like a bird's neſt, and filled with a quantity of green *drupæ*, about the ſize of half-grown apricots, and intermixed with the ſame kind of downy greyiſh leaves that ſurrounded them. The changes which had taken place from that time to the period of my arrival were, that the whole cluſter of fronds and fruit had become rather convex than concave, the fronds were browner, ſpines had grown at the tip of each of their lengthened ſegments, and the *drupæ* were become nearly as large as a moderate ſized apricot, and further reſembled that fruit in their rich orange hue and downy ſurface.

On ſeparating ſome of theſe woolly leaves, they were found to be true fronds. Each was from 6 to 8 inches long, fleſhy, entirely clothed with pale brown woolly down; their lower part a flattiſh ſtalk; their middle bearing on each margin a row of 3 or four ſeſſile *drupæ*; their extremity dilated into a pinnatifid, or rather palmate, many-fingered leaf, whoſe lobes were generally curved inwards, and tipped with a ſpine as before mentioned. When wounded, theſe fronds

 diſtilled

diſtilled a great quantity of thick clear inſipid mucilage, which ſoon hardened into a ſubſtance reſembling gum tragacanth, in which probably reſides the nutritive quality for which this Palm is ſo celebrated in the *Flora Japonica.* We are there told that a very ſmall morſel of the pith of its ſtem is ſufficient to ſuſtain life a long time, and on that account the plant is jealouſly preſerved for the uſe of the Japaneſe army. The *drupæ* are alſo ſaid to be uſed as food. We roaſted ſome, and found in their kernels the flavour of cheſnuts, with leſs ſweetneſs and a more watery conſiſtence. Each *drupa* is elliptical or ſomewhat obovate, a little compreſſed, tipped with a minute rigid point formed of the permanent ſtigma, which is umbilicated at its ſummit. The outer coat is coriaceous, bright orange red, clothed with woolly down which eaſily rubs off. This coat is not eatable. Nut ſolitary, elliptical, even, hard, whitiſh, tipped with a point connected with the ſtigma, and internally lined with a looſe brown membranous integument cloſely enfolding the kernel, which is alſo elliptical, white, firm, uniform, completely occupying the ſhell, and conſiſting entirely of *albumen* *. In its upper part, immediately under the ſtigma, we diſcovered a ſmall round cavity where the embryo ſhould have been, but no traces of it were to be found, for want of impregnation by the male pollen, which is produced on a ſeparate tree. Probably the flavour of the nuts might have been improved had they been impregnated.

Enough has been ſaid to ſhow the near affinity of this genus to *Zamia,* (ſee Gærtner, *tab.* 3.) from which it is chiefly, and indeed ſufficiently, diſtinguiſhed by its *drupæ* growing on a true frond, contraſted with the amentaceous fruit of *Zamia.* The two genera perhaps, conſtitute an intermediate order between *Palmæ* and *Filices,* but are ſurely moſt akin to the former.

* Gærtner rather chooſes to call it *vitellus* in *Zamia.*

The

Louisa North Del. Spec. Winton. Pinx.

Cycas revoluta

Cycas revoluta

The annexed figure (Tab. XXIX.) is taken from a fine drawing by Miſs North, preſented to the Society by the Biſhop of Wincheſter. It repreſents as much of the plant as was poſſible, ſomewhat under the natural dimenſions, nor could the full number of ſurrounding leaves be conveniently admitted.

Tab. XXX. exhibits one of the fronds of its full ſize. Fig. 1. is an abortive *drupa*; 2. a ripe one; 3. a *drupa* cut longitudinally; 4. all the integuments of the fruit; 5. *albumen*; 6. cavity deſtined to contain the embryo.

XXIV. *Species of Erica. By Richard Anthony Salisbury, Esq. F.R.S. & L.S.*

Read October 6, 1801.

ERICAS, in absolutâ monographiâ nunc illustrare, minime mihi propositum est. Attamen, quandoquidem in hoc genere nonnihil desudaverim, et multæ ejus pulcherrimæ species, sub ineptis ne dicam falsis hortulanorum titulis, iterum a *Willdenow* evulgantur, meos Characteres, et Nomina, demum profero.

Species ordinavi secundum earum affinitates, adeo ut inter se proxime collocentur simillimæ: cuivis diversæ methodo parum amicus. Etenim, si e numero foliorum separas, hunc non solum in unâ eâdemque stirpe mire ludentem offendes, sed tales divisiones magnitudine suâ laborantes fere nihil juvant: idem fortius objiciatur sectionibus ex antheris muticis calcaratisve petitis, quippe quæ valde propinquas species, imo ipsas varietates distrahunt: nec magis naturalem distributionem, vel e bracteis, vel ex inflorescentiâ, vel e filamentis, vel e fructu, adhuc extorquere potui. Jamdudum nos docuit *Linnè*, in Regno Vegetabili novæ prolis Herbam sequi patrem, Florem vero matrem: inde Clavis vastissimorum generum, ut mihi videtur, haud ita difficilis. Quamobrem cohortes e structurâ corollæ antherarumque potissimum desumpsi, gradumque affinitatis per comma, semicolon, rariusve colon, pone singula nomina appositum, indicavi: ubi nullum vidi præter communem generis nexum, ista species periodo notatur: multas enim similitudines oculis conspicimus, quas tamen verbis exprimere admodum difficile sit. Nihilominus in Differentiis Specificis, puras certissimasque notas eligere conatus sum, haud magis

magis quod opus eſſet dicere, quam quod non opus eſſet, non dicere, ſolicitus.

Mirum fortaſſe nonnullis videatur, Ericam *vulgarem* deſiderari in ſequentibus paginis: ſciant autem velim, hancce ſtirpem, ſi quæ alia in toto Ordine, proprium conſtituere genus: jure antiquiore profecto ſuum nomen retinuiſſet, ſed cum tot aliæ ſtirpes, apud omnes Botanicos jam eodem cognomine gaudeant, ſatius duxi hanc unam novo inſignire titulo: itaque *Callunam* appellavi, ob uſum ejus frequentiſſimum in ſcopis conficiendis: eſſentia generis, quâ differt ab *Ericâ*, eſt in pericarpii valvis ad latera loculorum dehiſcentibus, ſeptis axi relictis: habitus, abſque ullo rudimento petioli pedunculive, omnino ſeſſilis. Alterum genus, cum illo pariter confuſum, ob ſtigma grande *Salaxis* mihi audit, cujus calyx irregularis, et pericarpium drupaceum, triloculare, triſpermum: quatuor ſpecies innotuere, faciem Ericæ *ſcopariæ* præ ſe ferentes.

Paucas obſervatiunculas, in editione Diſſertationis Ericæ *a Thunberg*, quam nuper typis mandabam, inſerui. Hallucinationes graviores in tam vaſto genere pene inevitabiles, Synonyma infra tacite indicabunt: cæterum hæc non niſi ex ſpeciminibus ipſis auctorum unquam citavi. Maximâ profecto beneficientiâ ſua Herbaria mihi patefecerunt omnes, atque fruſtula vel rariſſimorum exemplarium communicaverunt: adeo ut ducentas et quinquaginta legitimas ſpecies nunc poſſideam, quarum dimidiam circiter partem in vivis alo. Haſce omnes, numeroſiſſimis varietatibus miſtas dignoſcere, et prout verum Botanicum decet exponere, haud labor erit paucorum annorum: nimis felix ſi qua hactenus videar veſtigiis inſtitiſſe admirandi *Linnè*, qui non abſque divino quodam afflatu, cum Vegetabilium differentias tradidit, longiſſimo intervallo omnes ſuperavit.

Synopſis

Synopſis Specierum, ſecundum earum Affinitates.

Scoparia. 3. *m. i. p : ax.*

Spiculifolia. 3. *m. i. ax.*

Virgularis, 3. *m. i. t.*
Aſperifolia, 3. *mc. i. t.*
Ferox. 3. *m. i. t.*

Oxycoccifolia, 3. *c. i. ax ?*
Thymifolia. 3. *c. ie. ax.*

Axillaris. 3:4. *c. i. ax.*

Sicæfolia. 3. *c. i. t.*

Urceolaris, 3. *c. i. t.*
Fauſta, 3. *c. i. t.*
Pallida, 3. *c. i. t.*
Tomentoſa, 3. *c. i. t.*
Auricularis, 3. *c. i. t.*
Lamellaris, 3. *c. i. t.*
Marifolia, 3. *c. i. t.*
Helianthemifolia. 2. *c. i. t.*

Calathiflora. 3. *c. i. t.*

Procera, 3:5. *c. i. t.*
Polytrichifolia. 3:5. *c. i. t.*

Tenuis. 3. *c. i. t.*

Humilis : 3. *c. i. t.*

Peduncularis : 3. *c. i. t.*

Amœna. 3. *c. i. t.*

Glomiflora, 3. *c. i. t.*
Formoſa. 3. *c. i. t.*

Carduifolia. . *c. i. t.*

Tubercularis. 3. *m. i. t.*

Campanularis. 3. *m. i. t.*

Medioliflora. 3. *m. i. t.*

Blanda, 3. *m. i. t.*
Hottoniæflora, 5. *c. i. ax.*
Seriphiifolia, 5. *m. i. ax.*
Lavandulæfolia, 3. *m. i. t.*
Humifuſa, 3. *m. i. t.*
Criſtæflora, 3. *m. i. t.*
Lyſimachiæflora, 3. *m. i. t.*
Paſſerinæfolia : 3. *m. i. t.*

Byſſina,

Byſſina, 3. *m. ic. t.*
Velleriflora, 3. *m. e. t.*
Carbaſina: 3. *m. e. t.*

Scarioſa, 3. *c. e. t.*
Sexfaria, 3. *c. e. t.*
Corydalis, 3. *c. i. t.*
Azaleæfolia, 3. *m. e. t.*
Petiolaris, 3. *m. i. t.*
Veſicularis, 3. *c. i. t.*
Verniciflua, 3. *c. i. t.*
Lachneæfolia, 3. *c. i. t.*
Volutæflora, 3. *c : m. i. t.*
Lyrigera, 3. *c. i. t.*
Salax, 3. *c. i. t.*
Gnidiæfolia, 3. *c. i. t.*
Cumuliflora, 3. *m. i. t.*
Geniſtæfolia, 3. *m. i. t.*
Periplocæflora, 3. *c. i. t.*
Lucida, 3. *c. i. t.*
Munda, 3. *c. i. t.*
Gnaphaliiflora. 3. *c. i. t.*

Fabrilis, 3. *c. i. t.*
Dianthifolia, 2. *c. i. t.*
Brevifolia, 3. *c. i. t.*
Chlamydiflora, 3. *c. i. t.*
Selaginifolia. 3. *c. i. t.*

Pannoſa. 3 : 5. *c. i. t.*

Hirſuta, 4. *m. i. t.*
Plumoſa, 4. *c. i. t.*
Ciliciiflora. 3. *m. i. t.*
Xeranthemifolia, 3. *m. e. t.*
Nodiflora, 3. *m. e. t.*
Floſculoſa, 4. *m. e. t.*
Exilis, 4. *m. e. t.*
Labialis, 3. *m. e. t.*
Embolifera, 4. *c. e. t.*
Dumoſa, 4. *c. e. t.*
Barbigera, 4. *m. e. t.*
Paleacea, 4. *m. e. t.*
Bruniæfolia, 6. *c. e. t.*
Turmalis, 6. *m. e. t.*
Equiſetifolia. 3. *m. e. t.*

Diotæflora, 3. *m. e. p:ax.*
Sertiflora, 3. *m. e. p : ax.*

Flexilis. 4. *m. e. ax.*

Saxatilis, 3-5. *m. e. p : ax.*
Lugubris, 4. *m. e. p : ax.*
Multiflora, 5-6. *m. c. p: ax.*
Manipuliflora, 3. *m. c. p :ax.*
Vaga. 5-6. *m. c. p:ax.*

Lentiformis : 3. *m. e. t.*
Pudibunda. 3-4. *m. e. t.*

Filiformis, 3. *c. e. t.*

Turgida,

Turgida. 3. *c. e. t.*

Fufiformis ; 3 : 4. *m. e. t.*
Fragilis ; 3. *m. e. t.*
Veftiflua, 3. *m. e. t.*
Baculiflora, 3. *m. e. t.*
Cothurnalis, 3. *m. e. t.*
Socciflora, 3. *m. e. t.*
Furfurofa, 3. *m. e. t.*
Follicularis, 3. *m. e. t.*
Penicilliflora. 3. *m. e. t.*

Placentæflora, 3. *m. e. t.*
Pyramidalis, 3. *m. e. t.*
Squamæflora, 3. *m. e. t.*
Cæfia, 3. *m. e. t.*
Flexuofa, 3. *m. e. t.*
Lafciva, 3. *m. e. t.*
Stylofa, 3. *m. e. t.*
Spirææflora, 3. *m. e. t.*
Milleflora. 3. *c. e. t.*

Diofmæfolia, 3. *c. i. t.*
Palliiflora, 3. *c. i. t.*
Fugax, 3. *c. i. t.*
Pyrolæflora, 3 : 4. *c. i. t.*
Tegulæfolia, 3. *c. i. t.*
Baccæformis. 4 : 3. *c. i. t.*

Modefta : 3. *c. i. t.*

Holofericea. 3. *c. i. t.*

Glauca : 3. *c. i. t.*

Variifolia. 3. *c. i. t.*

Rupeftris. 3. *c. i. t.*

Verficolor, 3. *m. i. t.*
Decora, 3. *c. i. t.*
Cupreffiformis, 3. *c. i. t.*
Melliflua. 3. *c. i. t.*

Nana, 4. *c. i. t.*
Spiffifolia, 6. *c. i. t.*
Sacciflora, 4. *c. i. t.*
Cylindriflora. 6. *c. i. t.*

Paludofa, 6. *m. i. t.*
Lituiflora. 4. *m. i. t.*

Obpyramidalis, 4. *m. i. t.*
Cyrillæflora, 4. *m. i. t.*
Velitaris. 4. *c. i. t.*

Culcitæflora, 4. *c. i. t.*
Tubiflora, 4. *c. i. t.*
Curviflora, 4. *c. i. t.*
Cufpidigera, 4. *c. i. t.*
Bibax, 4. *c. i. t.*
Buccinæformis, 4. *c. i. t.*

Faftuofa,

Faftuofa. 4. *c. i. t.*

Stagnalis, 4. *m. i. t.*
Confpicua; 4-5. *m. i. t.*
Longiflora, 6. *m. i. t.*
Verticillaris, 5-6. *m. i. t.*
Floccofa. 5-6. *m. i. t.*

Radiiflora, 8. *c. i. p : lat.*
Lycopodiifolia. 6. *m. i. p : lat.*

Pharetræformis, 6. *m. i. p : ax.*
Grandiflora, 6. *m. e. p : ax.*
Cerviciflora, 5-6. *c. e. p : ax?*
Pinifolia, 6. *c. i. p : ax.*
Calamiformis, 6. *m. i. p : ax.*
Longifolia, 6. *m : c. i. p : ax.*
Coftæflora, 6. *m. i. p : ax.*
Onofmæflora, 6. *m. i. p : ax.*
Pulviniformis, 6. *m. i. p : ax.*
Frondofa, 6. *m. i. p : ax.*
Phylicæfolia, 6. *m. i. p : ax.*
Argutifolia. 6. *m. i. p : ax.*

Favofa, 6. *c. i. p : ax.*
Sceptriformis, 8. *c. i. p : ax.*
Clavæflora, 6. *c. i. p : ax.*
Alveiflora, 6. *c. i. p : ax.*
Mammofa. 4. *c. i. p : ax.*

Brachialis. 4. *m. i. t.*

Hyftriciflora, 4. *m? i. t.*
Strigilifolia, 4. *c. i. t.*
Pectinifolia, 4. *c. i. t.*
Crinifolia. 6. *c. i. t.*

Cernua. 4. *c. i. t.*

Doliiformis. 6. *c. i. t.*

Piftillaris 4. *c. i. t.*

Ciliaris : 3. *m. i. ax.*

Botuliformis, 4. *c. i. t.*
Multicaulis. 6. *c. i. t.*

Mutabilis. 3. *c. i. lat.*

Uncifolia. 4. *c. i. p : ax.*

Caduceifera. 3. *c. i. p : ax.*

Empetrifolia, 6. *c. i. p : ax.*
Malleolaris, 6. *c. i. p : ax.*
Pyxidiflora, 6. *c. i. p : ax.*
Nolæflora. 6. *c. i. p : ax.*

Fefta, 4. *c. i. p : ax.*
Fallax, 6. *c, i. p : ax.*
Parilis, 6. *c. i. p : ax.*
Vifcida. 6. *c. i. p. ax.*

Catervæflora ; 4. *c. i. t.*
Pubigera, 4. *c. i. t.*
Mitræformis, 4. *c. i. t.*
Tardiflora, 4. *c. i. t.*
Parviflora, 4. *c. i. t.*
Exigua, 4. *c. i. t.*
Pufilla. 4. *c. i. t.*

Tragulifera, 4. *c. i. t.*
Guttæflora, 4. *c. i. t.*
Curviroftris, 4. *c. i. t.*
Obefa, 4. *c. i. t.*
Gracilis, 4. *c. i. t.*
Intervallaris, 4. *c. i. t.*
Quadræflora, 4. *c. i. t.*
Prolifera, 4. *c. i. t.*
Cyathiformis, 4. *c. i. t.*
Pelviformis. 4. *c. i. t.*

Turrigera, 4. *c. i. t.*
Lacunæflora, 3-5. *c. i. t.*
Florida. 4. *c. i. t.*

Turbiniflora, 4. *c. i. t.*
Bullularis, 3-4. *c. i. t.*
Mucofa, 4-6. *c. i. t.*
Piluliformis, 4-5. *c. i. t.*
Obliqua, 6. *c. i. lat.*
Sequax, 4-6. *c. i. t.*
Blenna. 4-5. *c. i. t.*

Verecunda. 4. *c. i. lat.*

Glabella. 4. *c. i. t.*

Embothriifolia, 3. *c. i. lat.*
Glutinofa, *alt. c. i. lat.*
Curvifolia : 3. *c. i. lat.*

Squarrofa, 6. *c. i. t.*
Gorteriæfolia, 4. *m. i. t.*
Ampullæformis, 4. *m. i. t.*
Capax, 4. *m. i. t.*
Lagenæformis, 3-4. *m. i. t.*
Jafminiflora : 3-4. *m. i. t.*

Pavettæflora, 4. *c. i. t.*
Fafciformis, 4. *m. i. t.*
Fiftulæflora, 4. *m. i. t.*
Fragrans, 4. *c: m. i. t.*
Galiiflora, 4. *c. i. t.*
Nidiflora, 4. *c. i. t.*
Denticularis, 4. *m. i. t.*
Pulchra, 4. *m. i. t.*
Daphniflora, 4. *m. i. t.*
Pellucida. 4. *m. i. t.*

Amabilis, 4. *c. i. ax.*
Venufta ; 4. *c. i. ax.*
Imbellis, 2. *c. i. ax.*
Linifolia, 2. *c. i. ax.*
Borboniæfolia, 2. *c. i. ax.*

6 Corifolia,

Corifolia, 3. *c. i. ax.*
Obvallaris, 3. *c. i. ax.*
Hyſſopifolia, 3. *c. i. ax.*
Taxifolia: 3. *c. i. ax.*
Pugionifolia, 3. *c. i. p : ax.*
Viminalis. 3. *c. i. p : ax.*

Figuræ Arabicæ numerum foliorum in ſingulis verticillis indicant: Litera *c.* filamenta calcarata, *m.* mutica; *e.* antheras exſertas, *i.* incluſas; *ax.* infloreſcentiam axillarem, *p : ax.* pſeudo-axillarem, *t.* terminalem, *lat.* lateralem.

ERICA.

Character Generis.

Corolla perſiſtens. Antheræ 4—10, ante antheſin per foramina duo lateralia connexæ. Pericarpium membranaceum, 4—8-loculare: Valvæ 4—8, medio loculorum una cum ſeptis ab axi dehiſcentes. Semina 10—100 in ſingulis loculis, decidua.

Differt ab *Andromedâ*, corollâ non deciduâ, et ſtructurâ antherarum: a *Menzieſiâ*, præter eaſdem notas, necnon fructu; ad quam *Erica Daboecii* referenda.

Characteres Specierum.

E. caule pubeſcentulo: corolla $\frac{3}{4}$-lineari, lævi; tubo cyathiformi: filamentis muticis: ſtigmate peltato. *Scoparia.*

E. fucata. *Thunb. Diſſ. n.* 9. E. ſcoparia. *Linn. Mant. p.* 372. E. ſcoparia. *Linn. Diſſ. n.* 13. *cum fig. floris.* E. coris folio IIII. *Cluſ. Hiſt. Pl. lib.* I. *p.* 42.

Cum ſuâ *Arboreâ* in Horto Cliffortiano olim confudit Linnè, neque poſtea filamenta eſſe mutica unquam animadvertit.

Spiculifolia. E. pedunculis ebracteatis: calyce breviter 4-fido: corollâ 1-lineari, lævi; tubo cyathiformi, 4-angulo: filamentis muticis.

E. olympiaca. *Sibth. MS.*

Sponte naſcentem in ſummitate Montis *Olympus*, legit heu defunctus Sibthorpe.

Perſingularis eſt defectus bractearum.

Virgularis, E. foliorum laminis plus minus ovatis: corollâ $\frac{2}{3}$—1-lineari, viſcidâ; tubo ſphærico: ſtigmate peltato.

Variat α: E. abſinthoides. *Linn. Mant. p.* 66.

β: E. virgata β. *Thunb. Diſſ. n.* 18.

γ: E. virgata γ. *Thunb. Diſſ. n.* 18.

δ: E. hiſpidula. *Linn. Suppl. p.* 222.

ε: E. hiſpida. *Thunb. Diſſ. n.* 20.

Ab hiſce omnibus longe diſcrepat E. virgata δ. *Thunb.* quæ, ni fallor, *Salaxis* eſt.

Aſperifolia, E. foliorum laminis linearibus: corollâ $1\frac{1}{4}$-lineari, viſcidâ; tubo ſphærico: filamentis ſæpius calcaratis: pericarpio lanato.

E. ſetacea. *Andr. Er. n.* 62. *cum Ic.* bonâ.

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Ferox. E. calcyce ſerrato: corollâ $1\frac{1}{2}$-lineari, lævi; tubo ventricoſo, dein iterum dilatato: pericarpio glabro.

E. totta. *Thunb. Diſſ. n.* 17.

Sponte naſcentem in *Konde Bockveldt*, legit F. Maſſon.

Bracteæ 3 juxta calycem.

Oxycoccifolia, E. caule decumbente, filiformi: foliorum laminis ovatis:

ovatis: corollâ $1\frac{1}{2}$-lineari, campanulatâ, hirſutâ: filamentis muticis.

Sponte naſcentem in *Hottentots Holland*, ſolo humido, legit I. Mulder.

Pulchella ſpecies: utinam ad vivam accuratius deſcribere mihi quandoque liceat: tum caulis, tum folia Oxycoccum *Paluſtrem* ad amuſſim ſimulant.

E. caule diffuſo: foliorum laminis ovatis: corollâ $1—1\frac{1}{2}$-lineari: filamentis baſi valde dilatatis: pericarpio hirſuto. *Thymifolia.*

Variat α: Corolla 1-linearis, viſcido-pubeſcens. Antheræ incluſæ.

E. planifolia. *Thunb. Diſſ. n.* 60. E. planifolia. *Berg. Pl. Cap. p.* 10. E. planifolia. *Linn. Sp. Pl. ed.* 2. *p.* 508.

β: Corolla $1\frac{1}{3}$-linearis, minutiſſime viſcido-pubeſcens. Antheræ exſertæ.

E. planifolia. *Willd. Sp. Pl. v.* 2. *p.* 362. E. africana hirſuta, &c. *Plukn. Mant. p.* 69. *tab.* 347. *pl.* 1.

γ: Corolla $1\frac{1}{2}$-linearis, lævis. Antheræ exſertæ.

E. thymifolia. *Wendl. Obſ. p.* 48.

Margo foliorum in omnibus conſtanter recurvulus.

E. foliorum laminis ſetuloſis: bracteis 2, minutis: corollâ $1\frac{1}{2}$-lineari, lævi: calcaribus ſubulatis, hirtis. *Axillaris.*

E. ſtrigoſa. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 17. E. arborea. *Thunb. Diſſ. n.* 63.

Sponte naſcentem in *Taffelberg*, legit F. Maſſon.

Variat floribus albis purpureiſque.

E. foliorum

Sicæfolia. E. foliorum laminis mucronatis: corollâ $1\frac{1}{3}$-lineari, extus hirſutâ; tubo cyathiformi: calcaribus lineari-attenuatis: pericarpio glabro.

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Nulli mihi cognitæ affinis eſt.

Urceolaris, E. foliorum laminis ſetoſis: corollâ 3-lineari, extus pubeſcente; tubo urceolari: calcaribus lineari-attenuatis.

E. dura. *Soland. MS.* E. hirta. *Thunb. Diſſ. n.* 56.

Flores pallide purpurei.

Fauſta, E. foliorum laminis ſetoſis: corollâ $2\frac{1}{3}$-lineari, extus pubeſcente; tubo urceolari: calcaribus aurito-attenuatis, valde ſerratis.

Sponte naſcentem in *Hottentots Holland*, ſolo humido, legit I. Mulder.

Valde ſimilis antecedenti: ſed Foliorum laminæ baſi latiores; Pubeſcentia alia; et Antheræ omnino diverſæ, in hac lineares ſeu totæ æqualis latitudinis, in illâ verſus apicem ſenſim anguſtatæ.

Pallida, E. foliorum laminis linearibus: calyce lateribus reduplicato: corollâ 2-lineari, utrinque pubeſcente: calcaribus brevibus.

E. pubeſcens piloſa. *Thunb. Diſſ. n.* 61. E. pubeſcens. *Linn. Sp. Pl. ed.* 2. *p.* 506. auctoritate ſpeciminis in ejus herbario a *Burman.*

Variat magnitudine et pubeſcentiâ foliorum; ſed, ni fallor, conſtanter 3-na ſunt.

E. foliorum

E. foliorum laminis angufte linearibus: calyce planiufculo: corollâ $1\frac{1}{2}$-lineari, utrinque tomentofâ: calcaribus longis, recurvis. *Tomentofa,*

Sponte nafcentem in *Hottentots Holland,* legit I. Mulder.

Bracteæ juxta bafin pedunculi fitæ, cum quo et calyce corollæ concolores.

E. foliorum laminis lineari-lanceolatis: corollâ 2-lineari, extus pubefcente; tubo ovato: calcaribus minutis, auricularibus. *Auricularis,*

Sponte nafcentem in *Hottentots Holland,* legit I. Mulder.

Herba fequentis: cæterum ab omnibus hujus cohortis, calcaribus minutis fere ut in *Galiiflorâ,* diverfa.

E. foliorum laminis lineari-lanceolatis: corollâ 3-lineari, tubo pyramidali, extus pubefcente: calcaribus glabris. *Lamellaris,*

E. urceolaris. *Pl. Kew. t.* 16. E. urceolaris. *Berg. Pl. Cap. p.* 107. E. pentaphylla. *Linn. Sp. Pl. ed.* 2. *p.* 506. E. caffra. *Linn. Sp. Pl. ed.* 1. *et* 2. auctoritate fpeciminis Cliffortiani.

Nulla pars in hac fpecie urceolaris eft: a foliis longis planiufculis, titulum faltem non falfum offero.

E. foliorum laminis late ovatis, planiufculis: corollâ $1\frac{2}{3}$-lineari, utrinque pubefcente; tubo ovato: calcaribus pubefcentibus. *Marifolia,*

E. marifolia.

E. marifolia. *Andr. Er. n.* 29. *cum Ic.* E. marifolia. *Pl. Kew. t.* 14. optima. E. marifolia. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 15.

Sponte nafcentem juxta *Conftantia* abunde, legit F. Maffon.

Helianthemifolia. E. foliis 2-nis; laminis obovatis planiufculis: corollâ 2-lineari, utrinque pubefcente: calcaribus longis.

E Promontorio *Cap.*

Communicavit primum cum viginti aliis fpeciebus *Georgius Hibbert,* ob raras difficillimafque ftirpes quas introduxit, merito celebris.

Calathiflora. E. calyce tomentofo: corollâ 1-lineari, lævi: calcaribus cuneatis, hirtis: pericarpio tomentofo: ftigmate longe exferto.

E. bicolor. *Thunb. Diff. n.* 57.

Procera, E. caule tomentofo: bracteis approximatis: calyce bafi medioliformi: corollâ 1—2-lineari: ftigmate peltato.

E. fcoparia. *Thunb. Diff. n.* 80. E. arborea. *Linn. Diff. n.* 14. *cum fig. floris.* E. caffra. *Linn. Diff. n.* 22. *cum fig. floris.* auctoritate fpeciminum ad quæ ibi defcripfit. E. triflora. *Berg. Pl. Cap. p.* 118. E. arborea. *Linn. Sp. Pl. ed.* 2. *p.* 502. E. fcoparia. *Linn. Sp. Pl. ed.* 1. *p.* 353, exclufis fynonymis. E. coris folio 1. *Cluf. Hift. Pl. lib.* 1. *p.* 41.

Sponte nafcentem juxta *Baia,* legit amiciffimus Smith. Variat admodum in diverfis regionibus, ftigmate etiam inclufo.

E. caule

E. caule tomentoso: bracteis remotis: calyce basi sensim angustato: corollà 1½—2-lineari: calcaribus cuneatis. *Polytrichifolia.*

Sponte nascentem prope *Lisboa*, legit Banks.

Prioris nonnullis varietatibus similis, sed hæc mihi videtur legitima species. Foliorum laminæ angustiores, magis attenuatæ. Flores in nostrà stirpe cultà plane inodori. Corolla oblonga: tubo poculiformi. Stigma fibulæ-forme, nec late peltatum. Pericarpium pyriforme.

E. caule divaricato: foliorum laminis linearibus: corollâ ¾-lineari, campanulatâ, lævi: filamentis brevissimis: calcaribus lineari-attenuatis. *Tenuis.*

E. divaricata. *Hortulanis.*

E. caule glabro: foliorum laminis argute reduplicatis: corollâ 2⅓-lineari: calcaribus longis, subulatis, hirtis. *Humilis.*

E. depressa. *Thunb. Diss. n.* 50. *cum Ic.*

E. foliorum laminis linearibus: corollâ 3-lineari: tubo globoso: antheris longissime foraminosis, lanatis. *Peduncularis.*

E. rubens. *Thunb. Diss. n.* 83.

Sponte nascentem in *Koude Bockveldt*, montibus, legit F. Masson.

Pedunculi pollicem longi sunt.

E. foliorum laminis lanceolatis: corollâ 4—5-lineari; tubo urceolari; limbo brevissimo: antheris breviter foraminosis, glabris. *Amœna.*

E. incarnata. *Thunb. Diss. n.* 84.

Toto cœlo diverſa ab E. *incarnatâ* hortulanorum, et non niſi ex ſpecimine *Thunbergiano* mihi cognita.

Glomiſlora, E. foliorum laminis anguſte cuneatis: calyce bracteis imbricato: corollâ $2\frac{1}{2}$-lineari, viſcidâ; tubo ſphærico: calcaribus villoſiſſimis.

E. veſicaria. *Soland. MS.*

Sponte naſcentem in *Hottentots Holland,* legit F. Maſſon.

Formoſa. E. calyce incurvo-deflexo: corollâ $1\frac{1}{4}$-lineari, viſcidâ; tubo ſphærico, 8-angulo: antheris baſi valde arcuatis: ſtigmate lato.

E. formoſa. *Thunb. Diſſ. n.* 82. *cum Ic.*

Sponte naſcentem in *Lange Kloof,* regionibus orientalibus, legit F. Maſſon.

Carduifolia. E. foliorum laminis ſetoſis: pedunculis longis: corollâ $2\frac{1}{2}$-lineari, lævi; tubo globoſo: filamentis breviſſimis.

Communicavit *Hibbert.*

Infloreſcentia adhuc mihi dubia: forte in rudimentis ramulorum terminalis. Stigma anguſtum.

Tubercularis. E. corollâ $1\frac{1}{3}$-lineari, tuberculis aſperâ; tubo globoſo: filamentis muticis: pericarpio longe ſtipitato.

E. inclyta. *Soland. MS.*

Antheræ minutæ, totæ læves.

Campanularis. E. caule glabro: foliorum laminis anguſtis: corollâ $2\frac{1}{2}$-lineari,

2½-lineari, campanulatâ, lævi: filamentis breviffimis, muticis.

E. tenuifolia. *Hortulanis.*

Sponte nafcentem in *Hottentots Holland*, locis humidis, legit F. Maffon.

Flos Convallariæ majalis *Linn.* fed luteus.

E. calyce tetraphyllo: corollâ 4-lineari, lævi; tubo medioliformi; limbo bafi integro: antheris papulofis. *Medioliflora.*

E. Thunbergii. *Linn. Suppl. p.* 220.

Genus jam tanto nomini facratur, nec cum fpecificis, hujufmodi titulos mifcendos effe cenfeo.

E. floribus glomeratis; corollâ 1⅓-lineari; limbo tubo ½ longiore, laciniis femiorbicularibus: ftigmate lato. *Blanda,*

E. cornuta. *Roxb. MS.*

In hac pulcherrimâ cohorte, Antheræ ipfæ ultra foramen in criftam plus minus producuntur.

E. calycis foliolis ferrulatis: corollâ 2½-lineari; limbo bafi integro, emarginulato: filamentis calcaratis. *Hottoniæflora,*

E. cubica. *Andr. Er. n.* 39. *cum Ic.* malâ. E. cubica. *Linn. Mant. p.* 233.

E. calycis foliolis minute ciliatis: corollâ 1½-lineari; limbo bafi integro, obtufo: filamentis muticis. *Scriphiifolia,*

E. cubica. *Thunb. Diff. n.* 46.

Sponte nafcentem in *Hottentots Holland*, montibus, legit I. Mulder.

Nullam *cubicam* partem in his duabus fpeciebus unquam detegere potui: præter notas autem fupra

memoratas, difcrepant Proportione, fitu Bractearum, et colore Antherarum. Flores in utraque axillares.

Lavandulæfolia, E. caule incano: bracteis juxta calycem: corollâ 2-lineari; tubo 4-angulo; limbo incurvo: filamentis inferne latiffimis.

Sponte nafcentem in *Hottentots Holland,* legit F. Maffon.

Humifufa, E. foliis 2-nis; laminis ovalibus; corollâ $1\frac{1}{2}$-lineari, limbo amplo: ftylo longe exferto.

E. humifufa. *Hibbert MS.*

Sponte nafcentem in *Hottentots Holland,* legit I. Mulder.

Herba tota glabra videtur.

Criftæflora, E. calyce tetraphyllo: corollâ 2-lineari; limbo tubo triplo longiore, bafi integro: pericarpio lævi.

E. melanthera. *Thunb. Diff. n.* 12.

Sponte nafcentem prope *Conftantia,* legit I. Mulder.

Lyfimachiæflora, E. calyce quadrifido: corollâ 2-lineari; limbo tubo duplo longiore, bafi integro: pericarpio fericeo.

E. melanthera. *Linn. Mant. p.* 232.

Stigma in hac longe exfertum.

Pafferinæfolia: E. bracteis minutis: calyce breviter quadrifido, denfe tomentofo: corollâ $2\frac{1}{2}$-lineari: pericarpio tomentofo.

E. pafferinæ. *Linn. Suppl. p.* 221. E. Cap. Coridis fol.

fol. fl. rubello. *Pet. Gaz. t.* 3. *f.* 7. *Cat. Top. n.* 469.

Folia in noſtris exemplaribus terna.

E. calyce denſe ſericeo, bracteis imbricato, quadrifido: corollâ 2-lineari, calyce parum longiore: nectario cotyliformi, rare hirto. *Byſſina,*

E. capitata. *Andr. Er. n.* 38. *cum Ic.* E. capitata. *Linn. Mant. p.* 373. E. capitata. *Linn. Diſſ. n.* 36. *cum fig. floris.* E. capitata. *Berg. Pl. Cap. p.* 94.

E. africana calyce lanuginoſo &c. *Seb. Theſ. v.* 1. *p.* 30. *t.* 20. *f.* 1.

Flores pallide lutei: antheris ſæpius incluſis.

E. calyce denſe ſericeo, bracteis remoto, quadrifido: corollâ $1\frac{3}{4}$-lineari, calyce parum longiore: nectario cotyliformi, glabro. *Velleriflora.*

E. bruniades. *Andr. Er. n.* 61. *cum Ic.* E. capitata. *Thunb. Diſſ. n.* 15. auctoritate ejus ſpeciminis. Eriocephalos Bruniades æthiopica, Corios, &c. *Plukn. Mant. p.* 69. *t.* 347. *f.* 9. auctoritate ejus ſpeciminis.

Sponte naſcentem in *Drakenſtein,* locis humidis, legit F. Maſſon.

Flores pallide purpurei.

E. calyce denſe ſericeo, bracteis remoto, tetraphyllo: corollâ $1\frac{3}{4}$-lineari, calyce multo longiore: nectario aſtragaliformi, ſericeo. *Carbaſina.*

E. bruniades. *Linn. Mant. p.* 378. E. bruniades. *Linn. Diſſ. n.* 52. *cum fig. floris.*

Flores albidi, pallide roſei, vel etiam lutei: dignoſcas

autem

autem a *Byssinâ*, bracteis calyce remotis; a *Vellcriflorâ*, foliis latioribus et magis tomentosis.

Scariosa, E. bracteis suborbiculatis: corollâ $1\frac{1}{2}$-lineari; limbo longitudine tubi; laciniis semilanceolatis: stigmate angusto.

E. scariosa. *Berg. Pl. Cap. p.* 102. E. spumosa. *Berg. Pl. Cap. p.* 103. auctoritate speciminum, quæ amicissimo *Swartz* debeo. E. spumosa. *Linn. Sp. Pl. ed.* 2. *p.* 508.

Nullam differentiam extricare potui in speciminibus Bergianis: hoc modo ante plenam explicationem florum, illud diu post, decerptum fuisse videtur. Filamenta rite calcarata sunt. Antheræ in herbariis cito caducæ.

Sexfaria, E. foliis glabris; corollâ $1\frac{1}{3}$-lineari, calyce obtectâ: calcaribus longis, marginalibus: pericarpio lævi.

E. sexfaria. *Pl. Kew. f.* 11. E. spumosa. *Thunb. Diss. n.* 14.

Antheræ hujus quoque post exsiccationem mox cadunt, proculdubio exsertæ.

Corydalis, E. foliorum laminis lanceolato-cuneatis: corollâ 2-lineari, limbo basi integro: antheris dorso alatis.

Communicavit *Hibbert*.

Nomen ab antheris galeam aliquatenus referentibus.

Azaleæfolia, E. foliorum laminis lanceolatis: corollâ $1\frac{1}{2}$-lineari, hirtâ: antheris exsertis, pene totis foraminosis.

E. spumosa. *Roxb. MS.*

Sponte nascentem in *Hottentots Holland*, legit I. Mulder.

Petiolaris, E. petiolis longis, cuneatis, fimbriatis: corollâ $2\frac{1}{2}$-lineari, apice pubescentulâ: pericarpio rare hirto.

E. petiolata.

E. petiolata. *Thunb. Diss. n.* 7. *cum Ic.* bonâ.
Facies Rosmarini Officinalis, *Linn.*

E. foliis vesiculis nigris aspersis: corollâ 1-lineari, viscido-pubescente: calcaribus parallelis, cuneatis: pericarpio sericeo. *Vesicularis,*
E. conacea. *Hortulanis.*
Sponte nascentem prope *Stellenbosch* inter montes, legit I. Mulder.
Frutex 3-pedalis; ramis erectis, valde fastigiatis.

E. foliis viscidis: corollâ $2\frac{1}{3}$-lineari, limbo recurvo: calcaribus aurito-cuneatis, hirtis: pericarpio lævi. *Verniciflua,*
E. glutinosa. *Roxb. MS.*
Foliorum laminæ obtuse acuminulatæ, reduplicaturâ dense glandulosæ, unde nitent glutine effuso.

E. foliorum laminis ovalibus, pubescentibus: corollâ 2-lineari, limbo recurvo: calcaribus longis, anguste cuneatis. *Lachneæfolia,*
E. lachnæa. *Hortulanis.*
Sponte nascentem in *Hottentots Holland,* legit F. Masson.
Differt ab antecedente foliorum laminis penitus obtusis, nec viscidis: calcaribus lævibus.

E. foliis lucidis: calycis lateribus inferne recurvis: corollâ $1\frac{2}{3}$-lineari; limbo revoluto: filamentis sæpe muticis: pericarpio tomentoso. *Volutæflora,*
E. nigrita. *Thunb. Diss. n.* 53. E. nigrita. *Linn. Diss. n.* 11. *cum fig. floris,* pessimâ. E. nigrita. *Linn. Mant. p.* 65. E. laricina. *Berg. Pl. Cap. p.* 94. E. africana, &c. *Seb. Thes. v.* 2. *p.* 11. *t.* 9. *f.* 7.

Calcaria

Calcaria brevia, parallela, cuneata, interdum omnino deficiunt.

Lyrigera, E. foliis lucidis: corollâ $1\frac{2}{3}$-lineari; limbo recurvo: calcaribus ſerratis: antheris lyræformibus, hirtis: pericarpio tomentoſo.

E. nigrita. *Roxb. MS.*

Hujuſce ſpeciei diagnoſis pulcherrima, antheris ante antheſin tot lyras referentibus.

Salax, E. foliis lucidis; calyce adpreſſo: corollâ $1\frac{2}{3}$ lineari: filamentis breviſſimis: pericarpio lævi: ſtigmate lato.

E. ramoſiſſima. *Roxb. MS.*

Sponte naſcentem in *Hottentots Holland,* montibus, legit F. Maſſon.

Facies *Volutæfloræ,* ſed præter differentias ſupra datas, corollæ laciniæ in hac, ni fallor, baſi diſtinctæ.

Gnidiæfolia, E. foliorum laminis lineari-lanceolatis, pubeſcentulis: calyce late obcuneato: corollâ 2-lineari: calcaribus auricularibus.

E. veſpertina. *Linn. Suppl. p.* 221. E. calycina. *Thunb. Diſſ. n.* 78. E. calycina. *Linn. Sp. Pl. ed.* 2. *p.* 507.

Cumuliflora, E. faſciculis 7—12-floris: calyce incano: corollâ $2\frac{1}{2}$-lineari; limbo inferne ciliato: pericarpio hirto: ſtigmate anguſto.

E. aggregata. *Roxb. MS.*

Sponte naſcentem in *Hottentots Holland,* legit I. Mulder.

E. faſciculis

E. fasciculis 3-floris: calyce viscido: corollâ 2-lineari; *Genistæfolia,* limbo inferne ciliato: pericarpio lævi: stigmate lato.

E. tetraloba. *Roxb. MS.*

Species ab antecedente penitus distincta; huic semina lævia, minute alveolata; illi lucida, æquata.

E. foliorum laminis lanceolato-cuneatis: pedunculis *Periplocæflora,* longis: calyce brevi, orbiculari: corollâ $1\frac{1}{2}$—2-lineari: stigmate angusto.

Communicavit *Hibbert.*

Flores in siccis saturate purpurei. Filamenta sæpius calcaribus brevibus cuneatis armata, interdum vero prorsus mutica.

E. calyce minute ciliato, lucido: corollâ 1-lineari: *Lucida,* calcaribus auricularibus, inciso-serratis: stigmate angusto, incluso.

Sponte nascentem in *Hottentots Holland,* legit I. Mulder.

E. bracteis calyceque integerrimis: corollâ 1-lineari: *Munda,* calcaribus auricularibus, ciliatis: pericarpio hirsuto.

Sponte nascentem in *Hottentots Holland,* legit F. Masson.

Specimen nostrum imperfectum est, ante explicationem florum lectum.

E. calyce patente, margine exquisite glanduloso: corollâ 1-lineari, calyce vix longiore: pericarpio lævi: *Gnaphaliiflora,* stigmate grandi 4-fido.

E. gnaphalodes. *Thunb. Diss. n.* 75. E. gnaphalodes. *Linn. Diss. n.* 25. *cum fig. floris,* pessimâ. E. gnaphalodes. *Berg. Pl. Cap. p.* 119.

Fabrilis; E. foliis denſe imbricatis: corollâ 1-lineari, calyce vix longiore: calcaribus integerrimis: antheris minutis, pene didymis.

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Herba recta, quaſi Fabri manu artificioſe impoſita.

Dianthifolia; E. foliis 2-nis, longis: calyce ovato-cuneato: corollâ 3-lineari: calcaribus ſerratis: pericarpio glabro.

Communicavit *Hibbert*.

Flores pallidiſſime purpurei.

Brevifolia, E. foliorum laminis ovatis: corollâ $1\frac{2}{3}$-lineari, calyce $\frac{1}{2}$ longiore: calcaribus lineari-attenuatis: feminibus ſtriatis.

E. brevifolia. *Soland. MS.*

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Chlamydiflora, E. foliorum laminis linearibus, hirſutis; corollâ 2-lineari, calyce vix longiore: calcaribus auricularibus: ſeminibus æquatis.

E. viſcaria. *Roxb. MS.*

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Calycis foliola fere diſtincta, erecto-recurva.

Selaginifolia. E. caule tomentoſo: corollâ $1\frac{2}{3}$-lineari, lævi: tubo globoſo: calcaribus latiſſimis, orbicularibus.

Sponte naſcentem in *Lange Kloof*, legit G. Paterſon.

Omnium ſpecierum, quas detexerunt *Roxburgh*, *Paterſon*, *Maſſon*, largo ſuo more copiam mihi fecit, ſummum noſtræ ætatis decus, *Banks*.

E. foliorum

E. foliorum laminis parum reduplicatis: corollâ 2-lineari, lanatâ: filamentis latis, breviter calcaratis: ſtylo exſerto. *Pannoſa.*

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Affinitatem neſcio: confer cum *Byſſinâ*, ſed folia videntur 4-na et antheræ diverſiſſimæ.

E. bracteis calyceque piloſiſſimis: corollâ 2-lineari, hirtâ, 4—5-andrâ: filamentis apice latiſſimis, muticis. *Hirſuta,*

E. hirſuta. *Thunb. Prodr. p.* 72.

E. foliis 4-nis, minutis: calyce piloſiſſimo: corollâ 1½-lineari, hirtâ, 4—5-andrâ: filamentis calcaratis. *Plumoſa,*

E. plumoſa. *Thunb. Prodr. p.* 73. Blæria ciliaris. *Linn. Suppl. p.* 122.

Nomen peſſimum eſt, verum ex fruſtulo noſtro aliud aptum excogitare nequeo.

E. foliis 3-nis, minutis: calyce piloſiſſimo, bracteis diſtincto: corollâ 1½-lineari, hirtâ, 4-andrâ: filamentis muticis. *Ciliciiflora,*

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Antheræ pene didymæ, valde barbatæ.

E. foliis 3-nis: laminis valde incurvis: calyce lanato, imbricato: corollâ 1¾-lineari, lanatâ, 4-andrâ. *Xeranthemifolia.*

Sponte naſcentem in *Hottentots Holland*, ſolo arido, legit F. Maſſon.

Facies diverſiſſimi generis.

Nodiflora, E. foliis 3-nis: calyce infundibuliformi, villofiffimo: corollâ $1\frac{1}{2}$-lineari, hirtâ, 4-andrâ: antheris breviter foraminofis.

Communicavit *Hibbert.*

Folia villofa, nec lanata.

Flofculofa, E. calyce fimbriato: corollâ $\frac{3}{4}$-lineari; tubo anguftiffimo, fuperne repente dilatato; 4-andrâ: filamentis anguftiffimis.

Sponte nafcentem in *Hottentots Holland*, legit F. Maffon.

Corolla refert flofculum difci in Ordine Naturali Compofitarum.

Exilis, E. foliis 4-nis: calyce infundibuliformi, glabro: corollâ $\frac{3}{4}$-lineari, glabrâ, 4-andrâ: filamentis muticis.

E. fcabra. *Thunb. Prodr. p.* 72.

Inflorefcentiam non rite intelligo, fpecimen enim unicum dilacerare nolui: videtur axillaris bracteis duabus in pedunculo breviffimo.

Labialis, E. foliis 3-nis; laminis glabris: calyce 2-labiato, fimbriato: corollâ $1\frac{1}{3}$-lineari, 2-labiatâ, 4—5-andrâ.

Blæria labiata. *Soland. MS.*

Sponte nafcentem in *Hottentots Holland*, legit F. Maffon.

Embolifera, E. bracteis folitariis: calyce infundibuliformi, quadrangulo: corollâ 2-lineari, 4-andrâ: calcaribus recte deflexis.

E. glabella. *Thunb. Prodr. p.* 73. Blæria pufilla. *Linn. Mant. p.* 39. auctoritate ejus fpeciminis. Blæria purpurea. *Berg. Pl. Cap. p.* 34.

Folia,

Folia, in numerofiffimis quæ vidi, tam cultis, quam indigenis exemplaribus, funt hirfuta. Inflorefcentia, ut in aliis hujufce cohortis eft fpica fafciculum mentiens, pedunculis breviffimis verticillatis, bracteâ loco folii fingulis fubjectâ.

E. foliorum laminis fimbriatis, fubtus glabris: corollâ $1\frac{1}{3}$-lineari, 4—5-andrâ: calcaribus recte exftantibus. *Dumosa,*
E. Blæria. *Thunb. Prodr. p.* 72. Blæria ericoides. *Linn. Sp. Pl. ed.* 2. *p.* 162.

E. calyce bracteis imbricato, profunde 4-fido, barbato: corollâ 2-lineari, glabrâ, 4—5-andrâ: filamentis muticis: ftylo anguftiffimo. *Barbigera,*
Sponte nafcentem in *Hottentots Holland,* legit F. Maffon.

E. bracteis folitariis: calyce infundibuliformi, toto hirfuto: corollâ $1\frac{1}{2}$-lineari, 4—5-andrâ: filamentis muticis. *Paleacea,*
E. articulata. *Thunb. Prodr. p.* 71. Blæria articulata. *Linn. Mant. p.* 198.
Sponte nafcentem in *Hottentots Holland,* legit F. Maffon.
Herba valde ludit; foliorum verticillis nunc diftinctis quafi caulis articulatus effet, nunc approximatis; laminis nunc brevibus, nunc longis et linearibus.

E. foliis longis: bracteis juxta calycem, exteriore longiffimâ: corollâ $1\frac{1}{2}$-lineari, 6-andrâ: filamentis calcaratis. *Bruniæfolia,*
E. hemifphærica. *Soland. MS.*
Sponte nafcentem in *Hottentots Holland,* legit F. Maffon.

E. pedunculis

Turmalis, E. pedunculis breviſſimis: calyce minuto, adpreſſo: corollâ 2-lineari, 4—5-andrâ: filamentis muticis: antheris latis.

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Facies antecedentis, ſed penitus diſtincta, calyce triplo minore.

Equiſetifolia, E. foliis 3-nis: faſciculis 3—5-floris: pedunculis longis, glabris: corollâ $1\frac{1}{2}$-lineari, 4—5-andra: filamentis muticis.

E. articularis. *Hortulanis.*

Herba ut in *Imbelli*, ſed etiam gracilior.

Sertiflora, E. calyce anguſte cuneato: corollâ $1\frac{1}{3}$-lineari; tubo urceolari: antheris totis exſertis: pericarpio lævi.

E. nudiflora. *Smith Pl. Ic. ined. n.* 57! E. nudiflora. *Linn. Mant. p.* 229.

Sponte naſcentem in *Taffelberg*, legit G. Paterſon.

Bracteæ, minutæ quidem, pro certo adſunt in exemplare Linnæano!

Diotæflora. E. calyce late cuneato: corollâ $1\frac{1}{2}$-lineari; tubo amphoræformi: antheris parum exſertis: pericarpio pubeſcente.

E. piſtillaris. *Soland. MS.*

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Flores in rudimentis ramulorum axillaribus.

Flexilis. E. pedunculis viſcidis, axillaribus: corollâ $1\frac{1}{2}$-lineari; tubo ovato: filamentis muticis: pericarpio lanato.

E. racemosa. *Thunb. Diss. n.* 47. *cum Ic.*
Inflorescentia in axillis simplex, nec racemosa.

E. foliorum laminis argute reduplicatis: corollâ $2\frac{1}{3}$-lineari; tubo pyramidali: antheris a medio foraminosis. *Saxatilis,*

E. carnea. *Curt. Bot. Mag. n.* 11. *cum Ic.* mediocri. E. carnea. *Jacq. Fl. Austr. v.* 1. *p.* 21. *f.* 31. E. carnea. *Scop. Fl. Carn. ed.* 2. *v.* 1. *p.* 275. E. purpurascens. *Linn. Diss. n.* 55. E. herbacea. *Linn. Diss. n.* 57. *cum fig. floris.* E. foliis, &c. *Hall. Hist. Helv. n.* 1013. E. herbacea. *Linn. Sp. Pl. ed.* 2. *p.* 501. E. carnea. *Linn. Sp. Pl. ed.* 2. *p.* 504. E. purpurascens. *Linn. Sp. Pl. ed.* 2. *p.* 503. exclusis omnibus synonymis præter sequens. E. procumbens foliis in summitate, &c. *Seg. Ver. v.* 2. *p.* 280. auctoritate speciminis a *Fabroni,* cui folia 5-na. E. procumbens, ternis foliis, carnea. *C. Bauh. Pin. p.* 486. E. procumbens herbacea. *C. Bauh. Pin. p.* 486. E. coris folio vii. viii. ix. *Clus. Hist. Pl. lib.* 1. *p.* 46.

Foliorum numerus certe ludit, adeo ut non amplius dubitaverim omnia supra citare synonyma.

E. foliorum laminis anguste cuneatis; floribus secundis; corollâ $1\frac{1}{2}$—2-lineari; tubo urceolari: antheris ab infra medium foraminosis. *Lugubris,*

E. mediterranea. *Curt. Bot. Mag. n.* 471. *cum Ic.* E. mediterranea. *Linn. Mant. p.* 229. E. mediterranea. *Linn. Diss. n.* 59. *cum fig. floris.* E. major florib. &c. *C. Bauh. Pin. p.* 485. E. coris folio 111. *Clus. Hist. Pl. lib.* 1. *p.* 42.

A saturo colore foliorum jamdudum distinxit *Clusius.*

E. foliorum

Multiflora, E. foliorum laminis linearibus: corollâ $1\frac{1}{2}$—2-lineari; tubo urceolari: antheris juxta apicem foraminoſis.

E. multiflora. *Linn. Diſſ. n.* 58. *cum fig. floris.* E. multiflora. *Linn. Sp. Pl. ed.* 1. *p.* 355. E. juniperifolia, &c. *Garid. Pl. Aix. p.* 160. *t.* 32. E. foliis corios multiflora. *I. Bauh. Hiſt. Pl. lib.* 10. *p.* 356. E. coris folio altera. 2. quæ Narb. &c. *Cluſ. Hiſt. Pl. lib.* 1. *p.* 42. E. juniperifol. &c. *Lob. Obſ. p.* 620.

Flores quoquoverſi, pedunculis longiuſculis.

Manipuliflora, E. caule incano: floribus in axillis interruptis: corollâ $1\frac{1}{2}$-lineari; tubo cyathiformi: antheris in ſertum erectis.

E. verticillata. *Forſk. Fl. p.* 210.

Juxta *Bujuchtar* a ſe lectam miſit amiciſſimus Sibthorpe.

Vaga. E. caule glabro: floribus in axillis contiguis: corollâ $1\frac{1}{3}$-lineari; tubo cyathiformi: antheris in ſertum erectis.

E. vagans. *Smith in Engl. Bot. n.* 3. *cum Ic.* E. multiflora. *Bulliard Fl. Par. t.* 203. E didyma. *Stokes in With. Arr. ed.* 2. *p.* 400. E. purpuraſcens. *Lamarck in Encycl. Bot. v.* 1. *p.* 488. E. vagans. *Linn. Mant. p.* 230. E. vagans. *Linn. Diſſ. n.* 56. *cum fig. floris.* E. foliis corios multiflora. *Ray Syn. ed.* 3. *p.* 471. E. procumbens dilute purpurea. *C. Bauh. Pin. p.* 486.

Antheræ non revera didymæ.

Lentiformis. E. bracteis calyci adpreſſis: corollâ $1\frac{1}{2}$-lineari; tubo lentiformi, baſi 8-angulo: antheris juxta apicem foraminoſis.

E. umbellata.

E. umbellata. *Pl. Kew. t.* 5. E. umbellata. *Linn. Sp. Pl. ed.* 2. *p.* 501. E. umbellata. *Loefl. Ref. p.* 138. E. coris folio v. *Cluf. Hift. Pl. lib.* 1. *p.* 43.

Flores ramis ultra folia productis terminales, nec umbellati.

E. foliis 3—4-nis: corollâ 2-lineari, vifcidâ; tubo ovato: antheris latis, exfertis, hirtis: pericarpio turbinato, hirto. *Pudibunda.*

E. nutans. *Wendl. Er. fafc.* 3. *p.* 5. *cum Ic.*

Hanc unice omnium quas propofui Ericarum, non vidi: icones autem a *Wendland*, fi rudes, fideliffimæ.

E. bracteis juxta calycem: corollâ 1-lineari, glabrâ; limbo recurvo: antheris longe foraminofis: ftigmate angufto. *Filiformis;*

Sponte nafcentem in *Hottentots Holland*, legit I. Mulder.

Caulis tenuis, diffufus. Folia 3-na, verticillis remotis: Laminæ anguftæ, recurvæ, vifcido-pubefcentes. Flores terminales. Filamenta ad apicem lata. Pericarpium læve.

E. pedunculis breviffimis: corollâ 1½-lineari, hirtâ; tubo modiali: calcaribus cuneatis: antheris breviffimis. *Turgida.*

E. fufco-rubens. *Roxb. MS.*

E. calyce bracteis remoto, cuneato, longitudine mire vario: corollâ 4—7-lineari, lævi; tubo ovato-pyramidali. *Fufiformis;*

 Variat

Variat α: Calyx $1\frac{1}{3}$-linearis. Corolla punicea, 6—7-linearis.

E. Pluknetii. *Linn. Sp. Pl. ed.* 1. *p.* 356.

β: Calyx $2\frac{1}{2}$—3-linearis. Corolla punicea, 6—7-linearis.

E. Pluknetiana. *Pl. Kew. t.* 9. optima. E. Pluknetii. *Linn. Sp. Pl. ed.* 2. *p.* 506. exclufis fynonymis.

γ: Calyx 1-linearis. Corolla albida, 3—$3\frac{1}{2}$-linearis.

E. Petiverii β. *Thunb. Diff. n.* 21.

δ: Calyx $2\frac{1}{2}$-linearis. Corolla albida 3—$3\frac{1}{2}$-linearis.

In noftro horto, cæteris elatior.

ε: Calyx 5-linearis. Corolla albida, 5-linearis.

Poftrema varietas maxime infignis eft.

Fragilis; E. foliorum laminis acute mucronatis: corollâ 7—9-lineari; limbo recurvo-horizontali: pericarpio barbato.

E. Bankfia. *Andr. Er. n.* 26. *cum Ic.*

Sponte nafcentem in *Hottentots Holland*, locis rupeftribus, legit F. Maffon.

Veftiflua, E. foliorum laminis incurvo-patentibus, junioribus pilofis: floribus folitariis: corollâ 7—9-lineari; tubo cylindraceo.

E. Petiveriana. *Roxb. MS.*

Corolla rufa.

Baculiflora, E. foliorum laminis recurvo-patentibus: floribus folitariis:

litariis: corollâ 6—8-lineari; tubo cylindraceo: pericarpio ovato.

Variat α: Corolla lutea.

E. Petiveri. *Linn. Mant. p.* 235. E. Petiveri. *Linn. Diss. n.* 50. *cum fig. floris.*

β: Corolla sordide rufa.

E. Petiverii α. *Thunb. Diss. n.* 21.

Limbus Corollæ obtusus, et instar affinium crenulatus in ipso specimine Linnæano.

E. foliorum laminis recurvo-patentibus; corollâ 7—9-lineari; tubo cylindraceo basi ventricosâ: pericarpio ovali. *Cothurnalis,*

Variat α: Bracteæ et Calyx glabriusculæ.

E. Sebana. *Pl. Kew. t.* 10. optima. E. coccinea. *Linn. Sp. Pl. ed.* 2. *p.* 505. E. africana, &c. *Seb. Thes. v.* 1. *p.* 32. *t.* 21. *f.* 4.

β: Bracteæ et Calyx pubescentes.

E. Pluknetii. *Berg. Pl. Cap. p.* 92.

Corolla in utraque læte rufa, et demum 4-angula.

E. foliorum laminis recurvo-patentibus: corollâ 4—6-lineari; tubo ovato-pyramidali: pericarpio ovato. *Socciflora.*

Variat α: Corolla lutea.

E. Sebana viridis. *Andr. Er. n.* 59. *cum Ic.* bonâ.

β: Corolla sordide rufa.

E. Sebana sordida. *Hortulanis.*

γ: Corolla læte punicea.

E. Petiveri. *Hortulanis.*

Limites, quibus ſtirpes ſub hoc et tribus præcedentibus titulis traditas diſtinguerem, vix inveni: omnes forſan rectius conjungendæ.

Furfuroſa, E. foliorum laminis incurvo-patentibus: corollâ 4—6-lineari, viſcidâ: filamentis latis: nectario cotyliformi.

E. monodelphia! *Andr. Er. n.* 22. *cum Ic.*

Filamenta forte latiſſima hujus generis.

Follicularis, E. foliorum laminis patentibus: floribus ſolitariis: corollâ 5—7-lineari, baſi inflatâ; nectario plinthiformi.

Variat α: Corollæ limbus mox ferrugineus.

E. Petiveriana. *Andr. Er. n.* 25. *cum Ic.* bonâ.

β: Corollæ Limbus mox atrobadius.

E. melaſtoma. *Andr. Er. n.* 43. *cum Ic.*

Folia penultima ultimaque baſi nonnihil dilatata.

Penicilliflora. E. corollâ 2-lineari, calyce obductâ; tubo ſphærico: antheris in penicillum acutum convergentibus.

E. Petiveri vera! *Hortulanis.*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Pulchra ſpecies, bracteis calyceque niveis.

Placentæflora, E. foliis obtuſiſſimis: corollâ calyce obductâ: tubo rapæformi: filamentis ſenſim dilatatis: ſtigmate anguſto.

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Herba pallidiſſime incana.

E. calyce

E. calyce bracteis imbricato: corollâ 1-lineari, longitudine calycis: antheris angustis, longis: pericarpio late gigartoideo. *Pyramidalis,*

E. imbricata. *Linn. Mant. p.* 372. E. imbricata. *Linn. Diss. n.* 53. *cum fig. floris.* E. quinquangularis. *Berg. Pl. Cap. p.* 117. E. imbricata. *Linn. Sp. Pl. ed.* 2. *p.* 503.

E. bracteis supra medium pedunculi sparsulis: corollâ ⅔-lineari, calyce breviore: antheris acuminulatis: pericarpio late ovato. *Squamæflora,*

E. imbricata. *Roxb. MS.*

Sponte nascentem prope *Baay Fals,* legit I. Mulder.

E. calyce bracteis imbricato: corollâ ⅔-lineari, calyce breviore: antheris obtusis, septo lato: pericarpio ovato. *Cæsia,*

Communicavit *Thunberg.*

Stigma latiusculum, quod in antecedente angustum.

E. bracteis supra medium pedunculi sparsulis: corollâ 1-lineari, calyce longiore: antheris obtusis septo angusto: nectario grandi. *Flexuosa,*

E. flexuosa. *Andr. Er. n.* 33. *cum Ic.*

Sponte nascentem juxta *Duyvelsberg* abunde, legit I. Mulder.

Pericarpium in hac turbinatum.

E. calyce bracteis imbricato: corollâ ⅔-lineari, calyce *Lasciva,*

parum

parum breviore: antheris a basi foraminosis: stigmate peltato.

E. imbricata. *Thunb. Diss. n.* 11. auctoritate ejus speciminis.

Facile dignoscas, Antheris longe foraminosis.

Stylosa; E. pedunculis longis: bracteis juxta calycem sparsulis: corollâ 1-lineari, calyce parum longiore: antheris acuminulatis: pericarpio ovali.

E. bracteata. *Roxb. MS.*

Stylus longissimus.

Spiraeaeflora; E. pedunculis glabris: corollâ 1—1½-lineari; limbo longitudine tubi, integerrimo: antheris juxta apicem foraminosis.

E. leucanthera. *Linn. Suppl. p.* 223.

Variat caule vix pubescente, et magnitudine florum.

Milleflora. E. caule tomentoso: corollâ $\frac{2}{3}$-lineari; laciniis basi imbricatis: calcaribus linearibus, laevibus: stigmate exserto.

E. milleflora. *Berg. Pl. Cap. p.* 96. E. paniculata. *Linn. Sp. Pl. ed.* 2. *p.* 508.

Si quae alia, legitima species: flores non paniculati, sed fasciculis trifloris terminalibus: a *Cyathiformi* stylo longe exserto dignoscenda.

Diosmaefolia. E. foliis lucidis: corollâ 2-lineari; laciniis imbricatis: filamentis angustissimis: calcaribus exquisite attenuatis, serrulatis.

E. subserrata. *Roxb. MS.*

Sponte nafcentem in *Hottentots Holland*, legit I. Mulder.
Folia latiora quam in plurimis.

E. caule angulato: foliorum laminis lanceolato-cuneatis: corollâ $1\frac{1}{3}$-lineari, calyce parum longiore: calcaribus auricularibus, glabris. *Palliiflora*;

E. candida. *Soland. MS.*

Sponte nafcentem in *Hottentots Holland*, legit F. Maffon.

E. foliorum laminis cuneatis: calyce obcuneato; corollâ $1\frac{3}{4}$-lineari; tubo parum 4-angulo, turbinato: calcaribus angufte cuneatis. *Fugax*,

E. triflora ariftata. *Wendl. Obf. p.* 47. E. triflora. *Thunb. Diff. n.* 79. *cum Ic.* E. triflora. *Linn. Mant. p.* 374. E. triflora. *Linn. Diff. n.* 23. *cum fig. floris.*

Hujus fpeciei florefcentia citiffime peragitur: non eft triflora. *Linn. Sp. Pl.* quare nomen mutavi.

E. foliorum laminis cuneatis: calyce ovato-cuneato: corollâ 2-lineari; tubo valde 4-angulo, fphærico: calcaribus late auricularibus. *Pyrolæflora*,

E. triflora. *Willd. Sp. Pl. v.* 2. *p.* 356. exclufis fynonymis.

Sponte nafcentem infra *Duyvelfberg*, legit I. Mulder.

Perfimilis antecedenti, fed accuratius infpecta valde differt; tubo corollæ apice intus fub finubus limbi, in tot carinas canaliculatas, extremitate pilis aliquot minutis barbatas, prominente.

E. foliorum laminis ovalibus, pubefcentibus: corollâ *Tegulæfolia*,

$1\frac{1}{2}$-lineari;

$1\frac{1}{2}$-lineari; tubo parum 4-angulo, turbinato: calcaribus grandibus, orbicularibus.

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Folia lata, et ordine recto imbricata.

Baccæformis. E. caule angulato: foliis ſæpius 4-nis: corollâ $2\frac{1}{3}$-lineari; tubo valde 4-angulo, turbinato: calcaribus auricularibus.

E. baccans. *Curt. Bot. Mag. n.* 358. E. baccans. *Linn. Mant. p.* 233. E. africana glabra fruticoſa arbuti flore. *Seb. Theſ. v.* 1. *p.* 32. *t.* 21. *f.* 3.

Folia interdum terna: quamobrem Corifoliam *Linn. Sp. Pl. ed.* 1 *et* 2. ad hanc quoque pertinere ſuſpicor.

Modeſta: E. foliis parvis, denſe imbricatis: corollâ $3\frac{1}{2}$-lineari, tomentoſâ; tubo late ovato; limbo recurvo: calcaribus lineari-attenuatis.

Communicavit *Hibbert.*

Flores pallidiſſime carnei.

Holoſericea: E. foliorum laminis argute reduplicatis: corollâ 3-lineari, holoſericeâ: tubo ovato: antheris hirtis.

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Species pulcherrima, ab omnibus huc uſque cognitis corollâ ſuâ holoſericea facile dignoſcenda. Primo intuitu *Taxifoliæ* affinem eſſe putavi, longe autem differt, cum infloreſcentiâ, tum numero bractearum.

Glauca: E. foliis glaucis, ſucculentulis: corollâ 3-lineari, extus rorida: calcaribus ſuborbicularibus.

E. glauca. *Andr. Er. n.* 47. *cum Ic.*

Sponte nafcentem in *Hottentots Holland*, legit F. Maffon.

Caulis 3-pedalis, teres. Folia 3-na, pene Sedi Reflexi Linn. laminis tamen fubtus pubefcentibus. Flores terminales. Pedunculi longi, una cum bracteis, calyce et corollâ omnes livido-purpurei. Stigma inclufum.

E. foliorum laminis lineari-attenuatis ovatifque: calyce recurvo-patente: corollâ 7—9-lineari: pericarpio globofo, 4-angulo. *Variifolia.*

E. Monfoniæ. *Pl. Kew. t.* 7. E. Monfoniana. *Thunb. Diff. n.* 52. *cum Ic.* E. Monfonia. *Linn. Suppl. p.* 223.

E. calyce adpreffo: corollâ 7—8-lineari; limbo pyramidali, convoluto apice recurvulo: pericarpio hemifphærico. *Rupeftris.*

E. halicacaba. *Pl. Kew. t.* 2. E. halicacaba. *Thunb. Diff. n.* 51. auctoritate ejus fpeciminis. E. halicacaba. *Linn. Diff. n.* 3. *cum fig. floris.* E. halicacaba. *Linn. Sp. Pl. ed.* 2. *p.* 507. E. halicacaba. *Linn. Amæn. Acad. v.* 5. *p.* 85.

Sponte nafcentem in *Taffelberg*, *Steenberg*, locis rupeftribus, legit F. Maffon.

E. calyce incurvo erecto: corollâ 8—10-lineari; tubo plus minus coftato: filamentis muticis, bafi dilatatis. *Verficolor,*

Variat α: Folia viridia. Corolla coccinea: tubo parum coftato. Antheræ bafi recte emarginatæ.

E. verficolor. *Andr. Er. n.* 12. *cum Ic.*

β: Folia viridia. Corolla ſaturate coccinea: tubo parum coſtato. Antheræ baſi furſum obliquæ.

Communicavit *G. Aiton*, princeps hortulanorum.

γ: Folia cæſia. Corolla ſaturate coccinea: tubo parum coſtato. Antheræ baſi furſum obliquæ.

E. diſcolor coccinea. *Hortulanis.*

δ: Folia cæſia. Corolla roſea: tubo valde coſtato. Antheræ baſi deorſum obliquæ.

E. coſtata. *Andr. Er. n.* 46. *cum Ic.*

Multas alias varietates nunc deſcribere ſuperſedeo.

Decora, E. calyce plano marginibus craſſis: corollâ 8—10-lineari, viſcido-pubeſcente; tubo clavato: calcaribus longis, pubeſcentibus.

E. Eweri. *Hortulanis.*

Flores pulcherrime roſeo-virides.

Cupreſſiformis, E. calyce adpreſſo: corollâ 9—11-lineari, glutine illitâ; tubo tenuiſſime ſtriato: calcaribus brevibus, glabris.

E. diſcolor. *Andr. Er. n.* 3. *cum Ic.* malâ.

Dignoſcas ab omnibus varietatibus *Verſicoloris*, filamentis anguſtioribus, et calcaratis.

Melliflua. E. bracteâ infimâ juxta baſin pedunculi: corollâ 9—12-lineari, lucidâ; tubo clavato, plus minus compreſſo: pericarpio ovato.

Variat

Variat α: Calyx valde ferratus. Corolla cruenta.
E. cruenta. *Pl. Kew. t.* 13. optima.
β: Calyx parum ferratus. Corolla punicea.
E. cruenta. *Andr. Er. n.* 17. *cum Ic.* E. cruenta. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 16.

Pofterior varietas eft longe pulchrior, et robuftior.

E. caule humifufo: foliis obtufis: corollâ 9—11-lineari, extus rorulentâ; tubo clavato, compreffo: calcaribus longis. *Nana,*

E. depreffa. *Hortulanis.*

Sponte nafcentem in *Hottentots Holland*, locis rupeftribus, legit F. Maffon.

Floret *Octobri, Novembri.*

Perfingularis eft hæc Erica, flores grandes luteos cauli humillimo jungens.

E. foliis denfiffimis: calyce longe cufpidato: corollâ 6—8-lineari, glabrâ; tubo cylindraceo: calcaribus longis. *Spiffifolia,*

E. Patterfonia. *Wendl. Er. fafc.* 1. *p.* 15. *cum Ic.* E. Patterfonia. *Andr. Er. n.* 7. *cum. Ic.* bonâ. E. abietina. *Linn. Diff. n.* 20. *cum fig. floris.* E. abietina. *Linn. Sp. Pl. ed.* 2. *p.* 506.

Sponte nafcentem juxta *Cap Fals*, legit G. Paterfon.

E. calyce late ovato, acuminulato: corollâ 6—8-lineari, glabrâ; tubo cylindraceo: calcaribus longis: antheris linearibus, valde papulofis. *Sacciflora,*

Sponte nafcentem in *Hottentots Holland*, legit F. Maffon.

Cylindriflora. E. foliis ciliatis fetis decompofitis: calyce recurvulo: corollâ 9-lineari, glabrâ: tubo cylindraceo: calcaribus brevibus.

E. ferratifolia. *Andr. Er. n.* 36. *cum Ic.*

Filamenta in noftris exemplaribus nunquam mutica.

Paludofa, E. corollâ 7—9-lineari, pubefcente, tubo parum clavato: antheris bafi roftratis: pericarpio apice cotyligero.

E. abietina. *Andr. Er. n.* 64. *cum Ic.* E. concinna. *Schneev. Ic. n.* 31. E. concinna. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 23. E. verticillata. *Berg. Pl. Cap. p.* 99. E. africana erecta, paludofa, &c. *Herm. Cat. Pl. Afr.*

Nomen antiquum, et hortulano utiliffimum, reftitui.

Lituiflora: E. calyce obovato: corollâ 6—8-lineari, pubefcente; tubo valde clavato: filamentis dorfo apicis barbatis.

E. perfpicua. *Wendl. Er. fafc.* 1. *p.* 7. *cum Ic.* E. Linnæi! *Hortulanis.*

Pericarpium in hac, et antecedente, 6—8-loculare.

Obpyramidalis, E. corollâ $3\frac{1}{2}$—4-lineari, pubefcente; tubo infundibuliformi; limbi interftitiis extrorfum tumidis: pericarpio fphærico.

E. pyramidalis. *Curt. Bot. Mag. n.* 366. *cum Ic.* E. pyramidalis. *Soland. in Ait. Hort. Kew. v.* 3. *p.* 401.

Sponte nafcentem juxta *Zwart Rivier*, locis humidis, legit F. Maffon.

Ad ftirpem vix naturalem, fuum nomen propofuit Solander,

lander, rami enim debiles, et penduli ſunt: itaque a tubo corollæ *Obpyramidalem* dixi.

E. caule tenui: corollâ 2½—3-lineari, pubeſcente: tubo anguſte campanulato; limbo brevi: filamentis muticis. *Cyrillæflora*;

Sponte naſcentem in *Hottentots Holland*, locis humidis, legit I. Mulder.

Flores pallide coccinei.

E. corollâ 2½—3-lineari, pubeſcente; tubo obovato; limbo recurvo-patente: calcaribus longis, argute cuneatis, parum ſerratis. *Velitaris.*

E. glabra. *Roxb. MS.*

Nomen noſtrum a foliis peranguſtis, Velitum jacula referentibus, petitum.

E. calyce ovato-cuneato: corollâ 7—8-lineari, pubeſcente; tubo cylindraceo-urceolari; limbo revoluto; pericarpio obpyramidali. *Culcitæflora*,

E. ſpuria. *And. Er. n.* 46. *cum Ic.*

Facies *Tubifloræ*, cui certo proxima, ſed nequaquam varietas. Filamenta evidenter calcarata, quæ mutica oſtendit figura citata.

E. pedunculis glabris: calyce anguſte lyrato: corollâ 9—10-lineari, pubeſcente: limbi interſtitiis baſi lanceolatis. *Tubiflora*,

Variat α: Corolla pallide carnea.

E. tubiflora.

E. tubiflora. *Linn. Diss. n.* 40. *cum fig. floris.*
E. tubiflora. *Linn. Sp. Pl. ed.* 2. *p.* 505.
β: Corolla læte carnea.
E. coccinea. *Linn. Diss. n.* 42. *cum fig. floris.*
E. foliis, &c. *Linn. Hort. Cliff. p.* 148. *n.* 10.
Antheræ in poſtremâ varietate longius foraminoſæ.

Curviflora, E. pedunculis pubeſcentibus: calyce ovato-cuneato: corollâ 9-lineari, pubeſcente; limbi interſtitiis baſi lanceolatis.

E. ſimpliciflora. *Willd. Sp. Pl. v.* 2. *p.* 402. E. curviflora. *Linn. Syſt. Veg. ed.* 13. *p.* 305. auctoritate ipſius ſpeciminis.

Haud facile eſt hanc in herbariis a *Tubiflorâ* ſemper dignoſcere, etſi facies viva multum abludat: foliorum laminæ autem in hac conſtanter lineari-attenuatæ, in illâ lineari-lanceolatæ: flores inſuper rufi.

Cuſpidigera, E. pedunculis glabris: calyce ovato-cuſpidato: corollâ 11—12-lineari, pubeſcente; limbi interſtitiis baſi lanceolatis: antheris hirtis.

Sponte naſcentem juxta *Berg Rivier,* legit I. Mulder.

Filamenta rare villoſa.

Bibax, E. calycis foliolis imbricatis, inæqualibus: corollâ 8-lineari, pubeſcente; tubo valde clavato; laciniis baſi imbricatis.

E. curviflora. *Thunb. Diſſ. n.* 30. E. Flammea. *Hortulanis.*

Sponte naſcentem juxta *Palmit Rivier,* legit F. Maſſon.

E. pedunculis

E. pedunculis pubefcentibus: corollâ 9—10-lineari, pubefcente; limbo recurvo-patente: filamentis pubefcentibus. *Buccinæformis,*
E. tubiflora. *Thunb. Diff. n.* 31.

E. pedunculis glabris: corollâ 10—11-lineari, glabrâ; limbo recurvo-patentiffimo: pericarpio late turbinato. *Fafluofa.*
E. curviflora. *Wendl. Er. fafc.* 3. *p.* 7. *cum Ic.* E. curviflora. *Andr. Er. n.* 40. *cum Ic.* E. curviflora. *Linn. Diff. n.* 41. *cum fig. floris,* peffimâ.
Species in folo natali forfan procera, nam culta in quatuor annis jam quindecimpedalis eft.

E. foliorum laminis hirfutis: pedunculis glabris: corollâ 10—11-lineari, hirfutâ: antheris rectis, papulofis. *Stagnalis,*
E. tubiflora. *Roxb. MS.*
Herba tota hirfuta eft: cæterum facies fequentis, floribus pariter flavis.

E. pedunculis pubefcentibus: calyce incurvo-erecto bafi extus concavâ: corollâ 15-lineari, pubefcente; limbo retufo. *Confpicua,*
E. confpicua. *Pl. Kew. t.* 12. optima. E. confpicua. *Andr. Er. n.* 29. *cum Ic.* E. confpicua. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 22.
Sponte nafcentem prope *Stellenbofch*, legit F. Maffon.

E. pedunculis glabris: calyce recurvo-patente bafi extus *Longiflora,*

convexâ: corollâ 18—20-lineari, pubefcente; limbo obtufo.

E. elata. *Hortulanis.*

Sponte nafcentem in *Hottentots Holland*, legit I. Mulder.

Herba, fi probe obfervas, exquifite pulverulenta.

Verticillaris, E. ramis verticillatis, lanatis: calyce incurvo-patente bafi extùs concavâ: corollâ 9—11-lineari, rare lanatâ.

E. lanata. *Wendl. Obf. p.* 45?

Sponte nafcentem in *Hottentots Holland*, legit I. Mulder.

Flores faturate rufo-fulvi.

Floccofa. E. ramis fparfis, lanatis: floribus fæpius 1-riis: calyce adpreffo bafi extus convexâ: corollâ 12-lineari, rare lanatâ.

E. fordida. *Andr. Er. n.* 56. *cum Ic.* quæ revera titulo refpondet. E. laniflora. *Wendl. Er. fafc.* 2. *p.* 23. *cum Ic.*

Affinis præ cæteris antecedenti: fed differt omnino Habitu, Tempore florendi, Foliorum laminis recurvis reclinatifve, Floribus fæpius tantum folitariis, Corollis latioribus limbo magis revoluto, Antherarum valvis bafi furfum oblique emarginatis.

Radiiflora, E. petiolis anguftiffimis: corollâ 13-lineari, vifcidâ; tubo cylindraceo-urceolari apice ventricofo: calcaribus fubulatis.

E. octophylla. *Willd. Sp. Pl. v.* 2. *p.* 372. E. fafcicularis. *Willd. Sp. Pl. v.* 2. *p.* 372. E. fafcicularis. *Pl. Kew.*

Pl. Kew. t. 6. E. coronata. *Andr. Er. n.* 10. *cum Ic.* bonâ. E. octophylla. *Thunb. Diss. n.* 72. *cum Ic.* E. fascicularis. *Linn. Suppl. p.* 219.

Sponte nascentem juxta *Hottentots Holland Kloof*, legit F. Masson.

E. foliis hirsutis: corollâ 10—11-lineari, viscidâ; tubo cylindraceo-urceolari apice ventricoso: pericarpio stipitato. *Lycopodii-folia.*

E. Massoni. *Pl. Kew. t.* 18. cæteris longe antecellente. E. Massoni. *Curt. Bot. Mag. n.* 356. *cum Ic.* E. Massonia. *Andr. Er. n.* 9. *cum Ic.* E. Massoni. *Linn. Suppl. p.* 219.

E. foliorum laminis recurvis, acutis: corollâ 13—15-lineari, viscidâ; tubo infundibuliformi; laciniis ovato-cuneatis. *Pharetræ-formis,*

Variat α: Corolla aurantiaca.
E. exsurgens. *Andr. Er. n.* 13. *cum Ic.*
β: Corolla rutila.
E. abietina. *Roxb. MS.*

Dignoscas ab omnibus mihi visis, corollæ laciniis versus apicem attenuatis bifidulisque.

E. foliorum laminis reclinatis, obtusiusculis: corollâ 12—14-lineari, viscidâ; tubo clavato: filamentis exsertis. *Grandiflora;*

E. grandiflora. *Pl. Kew. t.* 8. E. grandiflora. *Curt. Bot. Mag. n.* 189. *cum Ic.* E. grandiflora. *Thunb.*

Diff. n. 28! auctoritate ejus fpeciminis. E. grandiflora. *Linn. Suppl. p.* 223.

Sponte nafcentem juxta *Breede Rivier*, folo arenofo, legit F. Maffon.

Cerviciflora; E. corollâ 5—6-lineari, pubefcentulâ; tubo angufte urceolari; limbo patente: filamentis minute calcaratis.

E. inaperta. *Hortulanis.*

Sponte nafcentem in *Hottentots Holland*, legit I. Mulder.

Hæc fpecies primâ vice adhuc parcius floruit, nec ejus inflorefcentiam omnino intelligo, an revera hujus cohortis: bracteæ autem certo tres in fingulis pedunculis.

Pinifolia, E. calycis foliolis imbricatis, longe cufpidatis: corollâ 6—7-lineari, glabrâ; tubo clavato: filamentis calcaratis: pericarpio lævi.

E. pinea. *Thunb. Diff. n.* 26.

Sponte nafcentem prope *Baay Fals*, legit G. Robertfon.

Calamiformis, E. calyce adpreffo: corollâ 9—10-lineari, glabrâ; tubo cylindraceo-urceolari; limbo recurvo: pericarpio lævi.

E. radiata. *Andr. Er. n.* 53. *cum Ic.*

Bracteæ infra medium pedunculi.

Longifolia, E. petiolis anguftiffimis: corollâ 9—11-lineari, pubefcente; tubo plus minus clavato: filamentis fæpius muticis: pericarpio fuperne fericeo.

Variat

Variat α: Corolla alba.
E. veſtita alba. *Andr. Er. n.* 20. *cum Ic.* E. veſtita. *Thunb. Diſſ. n.* 25.
β: Caulis coarctatus. Corolla alba.
E. pinifolia. *Hortulanis*.
γ: Caulis coarctatus. Corolla rubra.
E. pinifolia. *Roxb. MS.*
δ: Caulis valde craſſus. Corolla pallidiſſime carnea.
E. longifolia. *Pl. Kew. t.* 4. optima.
ε: Corolla purpurea.
E. veſtita purpurea. *Andr. Er. n.* 8. *cum Ic.*
ζ: Corolla coccinea.
E. veſtita coccinea. *Andr. Er. n.* 33. *cum Ic.* E. veſtita coccinea. *Curt. Bot. Mag. n.* 402. *cum Ic.*
η: Caulis craſſus. Corolla carnea.
E. pinea. *Andr. Er. n.* 57. *cum Ic.*

In foliis omnium eſt etiam quædam differentia.

E. calyce adpreſſo: corollâ 5—6-lineari, viſcidâ; tubo clavato, coſtato: antheris juxta apicem foraminoſis. *Coſtæflora*,
E. Leea. *Andr. Er. n.* 20. *cum Ic.* bonâ.
Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

E. calyce apice recurvulo: corollâ 9—10-lineari, viſcidâ; tubo clavato, coſtato: antheris a medio foraminoſis. *Onoſmæflora*,
E glutinoſa. *Andr. Er. n.* 31. *cum Ic.* bonâ.
Flores ſulphurei.

Pulvini-formis, E. foliorum laminis attenuatis, ſerrulato-ciliatis: floribus in rudimentis ramorum longiuſculis: corollâ 7—9-lineari, viſcidâ; tubo cylindraceo-urceolari.

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Faciem *Crinifoliæ* mire ſimulat, ſed diſtinctiſſima eſt et inflorescentiâ, et filamentis, quæ prorſus mutica, atque inſtar ſequentis pubeſcentia.

Frondoſa, E. caule angulato: foliorum laminis attenuatis: calyce patulo: corollâ 9—10-lineari, viſcidâ; tubo vix clavato.

E. coccinea. *Wendl. Er. faſc.* 3. *p.* 9. *cum Ic.* E. coccinea. *Andr. Er. n.* 41. *cum Ic.* E. coccinea. *Thunb. Diſſ. n.* 27. E. coccinea. *Berg. Pl. Cap. p.* 93. E. abietina. *Linn. Sp. Pl. ed.* 1. *p.* 355. E. foliis ſubulatis, &c. *Linn. Hort. Cliff. p.* 148. *n.* 9. auctoritate ipſius ſpeciminis.

Sponte naſcentem juxta *Baay Fals*, legit G. Paterſon.

Phylicæfolia, E. caule tereti: foliorum laminis brevibus, parum attenuatis: calyce incurvo-erecto: corollâ 8—9-lineari, viſcidâ; tubo vix clavato.

E. purpurea. *Andr. Er. n.* 4. *cum Ic.*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Diu hærebam animi dubius, an tantum pro varietate antecedentis proponerem: ob herbæ multas differentias, et calycem, tandem ſeparavi.

Argutifolia. E. foliorum laminis valde attenuatis, argute reduplicatis:

tis: corollâ 5—6-lineari, viſcidâ; tubo infundibuliformi.

E. pulchella. *Thunb. Diſſ. n.* 24. *cum Ic.*

Neſcio quæ facies torva et ſcabra hanc ab affinibus primo intuitu diſtinguit.

E. pedunculis breviſſimis: calyce calloſo: foliolis rhombeo-ſpatulatis, integerrimis: corollâ 5—9-lineari, rorulentâ. *Favoſa,*

Variat α: Corolla 7—9-linearis; laciniis baſi contiguis.

E. ſpicata. *Wendl. Er. faſc.* 2. *p.* 27. E. ſpicata. *Thunb. Diſſ. n.* 71. *cum Ic.* E. ſeſſiliflora. *Linn. Suppl. p.* 222.

β: Corolla 5—7-linearis; laciniis baſi imbricatis.

E. ſpicata. *Andr. Er. n.* 6. *cum Ic.*

Infloreſcentia e collatione affinium ſpecierum tantummodo intelligenda, rudimentis ramulorum pedunculos ſimulantibus, veris pedunculis ſane omnium breviſſimis, aut nullis.

E. caule ſtricto: pedunculis breviſſimis: calyce calloſo, foliolis late ſpatulatis, inciſo-ſerratis: corollâ 7—10-lineari, rorulentâ. *Sceptriformis,*

E. enneaphylla. *Roxb. MS.*

Foliorum numerus ultra 4-narium, in toto genere valde inconſtans eſt.

E. pedunculis breviſſimis: calycis foliolis orbiculato- *Clavæflora,*

ſpatulatis,

ſpatulatis, integerrimis: corollâ 10—12-lineari, rorulentâ.

Communicavit *Hibbert.*

Herba ad amuſſim ſequentis.

Alveiflora, E. pedunculis glabris: corollâ 7—9-lineari, rorulentâ; tubo cylindraceo-urceolari, inferne 4-angulo.

E. gelida. *Hortulanis.*

Sponte naſcentem in *Hottentots Holland,* ſolo humido, legit F. Maſſon.

Mammoſa. E. pedunculis pubeſcentibus: corollâ 8—10-lineari, rorulentâ; tubo cylindraceo-urceolari, juxta baſin 4-foſſo.

Variat α: Corolla coccinea.

E. verticillata. *Willd. Sp. Pl. v.* 2. *p.* 370. E. verticillata. *Andr. Er. n.* 21. *cum Ic.* E. ſpecioſa. *Schneev. Pl. n.* 3. *cum Ic.*

β: Corolla læte purpurea.

E. mammoſa. *Andr. Er. n.* 58. *cum Ic.* E. abietina. *Schneev. Pl. n.* 23. *cum Ic.* E. abietina. *Thunb. Diſſ. n.* 68. auctoritate ejus ſpeciminis. E. mammoſa. *Linn. Mant. p.* 234. E. mammoſa. *Linn. Diſſ. n.* 21. *cum fig. floris.* E. abietina. *Berg. Pl. Cap. p.* 105. auctoritate ejus ſpeciminis. E. folio Juniperi, &c. *Buxb. Cent.* 4. *p.* 25. *t.* 41. 42. E. african. arboreſcens, &c. *Barth. Act. v.* 2. *p.* 57. *cum Ic.*

γ: Corolla ſordide purpurea.

E. abietina. *Willd. Sp. Pl. v.* 2. *p.* 369.

Hæ

Hæ tres, et aliæ varietates, omnes ludunt ſtigmatibus interdum exſertis.

E. corollâ 6—8-lineari, utrinque hirſutâ; tubo curvo, pyramidali: antheris incluſis, longiſſimis. *Brachialis.*

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Herba Sexfariæ.

E. foliorum laminis lineari-attenuatis, ſetis aſperſis: calyce cuneato: corollâ 4—6-lineari, extus totâ ſetoſâ. *Hyſtrici-flora,*

E. Spaarmanni. *Thunb. Diſſ. n.* 33. E. Spaarmanni. *Linn. Suppl. p.* 219. E. Spaarmanni. *Linn. in Act. Holm.* 1778. *p.* 24. *t.* 2.

Sponte naſcentem juxta *Kromme Rivier*, legit A. Spaarman.

E. foliorum laminis ovato-cuneatis, breviter pectinatis: calyce cuneato: corollâ 6—7-lineari, extus verſus apicem ſetoſâ. *Strigilifolia,*

E. tranſparens. *Thunb. Prodr. p.* 71. E. cerinthoides γ. *Thunb. Diſſ. n.* 33.

Filamenta in hac calcarata.

E. foliorum laminis anguſte ovato-cuneatis, pectinatis: calyce rhombeo-ſpatulato: corollâ 5—7-lineari, intus lanatâ. *Pectini-folia,*

E. cerinthoides β. *Thunb. Diſſ. n.* 33.

Sponte naſcentem in *Lange Kloof*, legit F. Maſſon.

E. foliorum laminis lineari-lanceolatis, piloſis: calyce cuneato: corollâ 8—10-lineari, extus viſcido-piloſâ. *Crinifolia.*

E. cerinthoides. *Andr. Er. n.* 25. *cum Ic.* E. cerin-

thoides. *Curt. Bot. Mag. n.* 220. *cum Ic.* E. cerinthoides α. *Thunb. Diff. n.* 33. E. cerinthoides. *Berg. Pl. Cap. p.* 104. E. cerinthoides. *Linn. Diff. n.* 43. *cum fig. floris.* E. cerinthoides. *Linn. Sp. Pl. ed.* 2. *p.* 505. E. coris folio, &c. *Breyn. Cent. p.* 25. *t.* 13. E. africana umbellata, &c. *Barth. Act. v.* 2. *p.* 57.

Ludit interdum una eademque ftirps, corollis multo brevioribus, erectis, ftigmate longe exferto. Filamenta conftanter calcarata funt, nec mutica.

Cernua. E. bracteis decurrentibus: calyce valde fimbriato: corollâ 2½-lineari; tubo globofo: calcaribus auricularibus.

E. cernua. *Linn. Suppl. p.* 222. E. cernua. *Montin in Nov. Act. Upf. v.* 2. *p.* 291. *t.* 9. *f.* 3.

Sponte nafcentem in *Koude Bockveldt*, legit F. Maffon.

Doliiformis. E. foliis hirfutis: bracteis juxta calycem: corollâ 4–5-lineari, vifcidâ; tubo urceolari: calcaribus brevibus, cuneatis.

E. mammofa. *Thunb. Diff. n.* 69. *cum fig.* in ed. noftrâ.

Nulla mihi cognitæ affinis, nifi forte *Pallidæ.*

Piftillaris. E. pedunculis foliolis gemmaceis obfitis: corollâ 3-lineari, lævi; tubo curvulo, infundibuliformi; limbo recurvo.

E. auftralis. *Linn. Mant. p.* 231. E. coris folio 11. *Cluf. Hift. Pl. lib.* 1. *p.* 42.

Semina ad hilum, appendiculam fungofam exferunt.

Ciliaris. E. foliorum laminis ovatis; corollâ 4-lineari, lævi; tubo ovato-pyramidali latere fuperiore ventricofiore.

E. ciliaris.

E. ciliaris. *Curt. Bot. Mag. n.* 484. *cum Ic.* bonâ. E. ciliaris. *Linn. Diff. n.* 39. *cum fig. floris.* E. ciliaris. *Linn. Sp. Pl. ed.* 1. *p.* 354. E. ciliaris. *Loefl. Ref. p.* 138. E. xii. *Cluf. Hift. Pl. lib.* 1. *p.* 46.

Folia terna funt, at juxta fequentem in ferie naturali, ni fallor, locanda eft, ob corollæ fimilitudinem.

E. foliorum laminis ciliatis: calyce adpreffo: corollâ 3-lineari, apice extus pubefcente: calcaribus lanceolatis. *Botuliformis,*

E. Tetralix. *Curt. Fl. Lond. fafc.* 1. *t.* 21. bona. E. Tetralix. *Linn. Sp. Pl. ed.* 2. *p.* 507.

E. foliorum laminis fubtus bifulcis: calyce patente: corollâ $2\frac{1}{2}$-lineari, lævi: calcaribus auricularibus. *Multicaulis.*

E. ftricta. *Willd. Sp. Pl. v.* 2. *p.* 366.

Sponte nafcentem in Inf. *Corfica,* legit G. Jones.

Caules undique diffufi, nequaquam ftricti.

E. floribus caule nudo verticillatis: corollâ 3-lineari; tubo urceolari: calcaribus auricularibus. *Mutabilis.*

E. cinerea. *Curt. Fl. Lond. fafc.* 1. *t.* 25. bona. E. cinerea. *Linn. Sp. Pl. ed.* 2. *p.* 501. E. cinerea. *Loefl. Ref. p.* 137.

Flores purpurei, mox cum primum marcefcunt cærulei, ut defcripfit Loefling.

E. caule glabro: foliorum laminis recurvis, attenuatis: corollâ $1\frac{3}{4}$-lineari, obovatâ: calcaribus longiffimis. *Uncifolia.*

E. regerminans. *Linn. Mant. p.* 322.

Flores in rudimentis ramulorum axillaribus, nec racemofi: ad exemplar Linnæanum characterem concinnavi, nec in ullo alio herbario adhuc vidi.

Caduceifera. E. foliorum laminis cuneatis ovatifve: corollâ $\frac{2}{3}$-lineari: filamentis juxta medium calcaratis.

E. pulchella. *Andr. Er. n.* 51. *cum Ic.* mediocri. E. articularis. *Thunb. Diff. n.* 58. E. pulchella. *Houtt. Nat. Hift. v.* 4. *p.* 504. *t.* 23. *f.* 1.

Sponte nafcentem in *Hottentots Holland*, legit F. Maffon.

Hæc fpecies, primum, veram infertionem calcarium *Ericarum* mihi docuit, cujus ftamina Mercurii fabulofum caduceum lepide fimulant: nempe in omnibus non ab antheris fed e filamentis ortum fuum ducunt.

Empetrifolia, E. calyce tetraphyllo: corollâ-2-lineari, hirfutâ; tubo urceolari; limbo recurvo-patente: ftigmate longe exferto.

E. empetrifolia. *Thunb. Diff. n.* 70. E. empetrifolia. *Linn. Mant. p.* 374. E. empetrifolia. *Linn. Diff. n.* 15. *cum fig. floris*, peffimâ.

Sponte nafcentem juxta *Baay Fals*, legit F. Maffon.

Malleolaris, E. calyce quadrifido: corollâ 1$\frac{2}{3}$-lineari, lævi; tubo urceolari; limbo recurvo-patentiffimo: pericarpio hirfuto.

E. empetrifolia. *Schneev. Pl. n.* 17. *cum Ic.* E. empetrifolia. *Houtt. Nat. Hift. v.* 4. *p.* 517. *t.* 23. *f.* 2. E. empetrifolia. *Berg. Pl. Cap. p.* 120. auctoritate ejus fpeciminis.

Herba antecedentis, fed flores diverfiffimi.

E. calyce

E. calyce quadrifido: corollâ 2-lineari, lævi; tubo obovato; limbo incurvo-patente: pericarpio hemifphærico, glabro. *Pyxidiflora,*

E. empetroïdes. *Hortulanis.*

Flores odorem ceræ Apum fpirant.

E. calyce tetraphyllo: corollâ 2-lineari, lævi; tubo calathiformi; limbo recurvo-patente: ftigmate inclufo. *Nolæflora.*

Sponte nafcentem in *Hottentots Holland,* legit F. Maffon.

Pedunculi multo longiores quam affinium, floribus in meâ ftirpe cultâ ultra folia extantibus.

E. caule valde angulato: foliis 4-nis: corollâ 2½-lineari, vifcidâ; tubo angufte urceolari: filamentis muticis. *Fefta,*

Sponte nafcentem in *Hottentots Holland,* legit I. Mulder.

Flores fulvi: in cæteris hujufce cohortis mihi vifis folia femper 5—6-na.

E. corollâ 2-lineari, vifcidâ; tubo urceolari, parum coftato: filamentis longitudine tubi, calcaratis: pericarpio vifcido. *Fallax,*

Sponte nafcentem in *Hottentots Holland,* legit F. Maffon.

Antheræ 2-partitæ, vix tamen revera didymæ.

E. corollâ 3-lineari, vifcidâ; tubo urceolari, parum coftato: filamentis vix longitudine tubi, minute calcaratis. *Parilis,*

Sponte nafcentem in *Hottentots Holland,* legit F. Maffon.

Habitus prioris, fed præter calycis foliola bafi anguftiora, Antheræ duplo majores funt, et calcaria filamenti apicem pene tota decurrunt.

Viscida. E. corollâ 3-lineari, viscidâ; tubo cyathiformi, costato: filamentis brevissimis: pericarpio sericeo.

Variat α: Folia incana, $1\frac{1}{2}$—3 lineas longa.

E. viscaria. *Thunb. Diss. n.* 40. E. viscaria. *Linn. Mant. p.* 231. E. viscaria. *Linn. Diss. n.* 46. *cum fig. floris*, pessimâ.

β: Folia viridia, 3—5 lineas longa.

E. viscaria. *Andr. Er. n.* 55. *cum Ic.* E. viscaria. *Pl. Kew. t.* 1. optima, partibus dissectis exceptis.

Facie admodum discrepant hæ varietates.

Catervæflora. E. caule angulato: corollâ 2-lineari, pubescente; tubo anguste obovato: antheris longe foraminosis.

E. pubescens 3. villosa. *Thunb. Diss. n.* 61.

Sponte nascentem in summitate *Taffelberg*, legit C. P. Thunberg.

Species legitima proculdubio, gravis enim est differentia caulis antherarumque.

Pubigera, E. calyce patente, ovato-acuminato: corollâ $1\frac{1}{2}$-lineari, pubescente; limbo longiusculo, recurvo: pericarpio hirto.

Communicavit *Hibbert.*

Facile dignoscas limbo corollæ longiusculo, recurvo, et penitus obtuso.

Mitræformis, E. foliorum laminis parum reduplicatis, fimbriatis: corollâ $1\frac{1}{2}$-lineari, pubescente; limbo erecto: pericarpio glabro.

E. pubescens.

E. pubescens. *Andr. Er. n.* 60. *cum Ic.* E. hirtiflora. *Curt. in Bot. Mag. n.* 481. *cum Ic.* optimâ. E. pubescens 2 : hispida. *Thunb. Diss. n.* 61.

Folia aliquando sparsula, cæterum, ut in ipso specimine Thunbergiano, quaterna.

E. calyce adpresso, anguste ovato-cuneato : corollâ $1\frac{1}{3}$-lineari, pubescente ; limbo brevissimo, recurvo : pericarpio hirto. *Tardiflora,*

E. pubescens. *Curt. in Bot. Mag. n.* 480 *cum Ic.* optimâ.

Sponte nascentem juxta *Taffelberg*, legit F. Masson.

Hanc ab antecedente probe distinxit *Curtis* : differt enim caule graciliore ; ramis floriferis multo brevioribus ; foliorum laminis magis incurvis, lateribus valde reduplicatis, integerrimis ; corollæ laciniis recurvis, latius imbricatis ; calcaribus angustioribus ; antheris glabris, foraminibus brevioribus ; denique seminibus scrobiculatis.

E. calyce adpresso, rhombeo-cuneato : corollâ $1\frac{1}{3}$-lineari, pubescente ; calcaribus auricularibus : pericarpio glabro. *Parviflora,*

E. pubescens. *Linn. Diss. n.* 19. *cum fig. floris.* E. pubescens. *Berg. Pl. Cap. p.* 121. E. parviflora. *Linn. Sp. Pl. ed.* 2. *p.* 506.

Folia quaterna, laminis valde reduplicatis.

E. calyce adpresso, ovato-acuminato : corollâ 1-lineari, pubescente ; tubo ovali ; limbo brevissimo : calcaribus lineari-attenuatis : pericarpio glabro. *Exigua.*

E. pubescens 4: parviflora. *Thunb. Diss. n.* 61.
Folia interdum terna, sæpius quaterna.

Pusilla. E. calyce adpresso, late ovato-cuneato: corollâ $\frac{3}{4}$-lineari, pubescente; tubo calathiformi; limbo longitudine tubi: pericarpio glabro.

Sponte nascentem prope *Baay Fals*, legit I. Mulder.

Non solum parvitate, sed etiam proportione omnium partium floris, a cæteris hujus cohortis abludit.

Tragulifera; E. calyce imbricato: corollâ $2\frac{1}{3}$-lineari; tubo urceolari; limbo recurvo: calcaribus hirsutis: antheris latissime foraminosis, hirsutis.

Sponte nascentem in *Hottentots Holland*, legit F. Masson.

Guttæflora, E. foliorum laminis lineari-attenuatis: corollâ 1—$2\frac{1}{2}$-lineari; laciniis apice guttâ illitis: calcaribus pubescentibus.

Variat α: Caulis fastigiatus. Corolla 1—$1\frac{1}{2}$-linearis, tubo hemisphærico. Stigma longe exsertum.

E. lateralis. *Willd. Sp. Pl. v.* 2. *p.* 380.

β: Caulis demissus. Corolla 2-linearis, tubo late ovato. Stigma breviter exsertum.

E. incarnata. *Andr. Er. n.* 27. *cum Ic.*

γ: Caulis demissus. Corolla $2\frac{1}{2}$-linearis, tubo ovato. Stigma breviter exsertum.

E. rubens humilis. *Wendl. Er. fasc.* 3. *p.* 13. *cum Ic.*

Flores non vere axillares, sed rudimentis ramulorum.

E. foliorum laminis linearibus: calyce adpreſſo: corollâ $1\frac{1}{2}$-lineari; tubo ſphærico: calcaribus pubeſcentibus: ſtylo ſurſum curvo. *Curviroſtris*,

E. declinata. *Hortulanis.*

Frutex humilis, vix pro varietate prioris habendus, Antheris nimium diverſis. Flores gravem, et plane nauſeoſum odorem ſpargunt.

E. pedunculis glabris: calyce incurvo-patente: corollâ $1\frac{3}{4}$-lineari; tubo ſphærico: calcaribus auricularibus, glabris. *Obeſa*,

E. margaritacea. *Andr. Er. n.* 54. *cum Ic.* malâ. E. margaritacea. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 20.

Sponte naſcentem juxta *Stellenboſch*, legit F. Maſſon.

E. calyce minuto: corollâ $1\frac{1}{3}$-lineari; tubo ovali; limbo recurvo: calcaribus lineari-attenuatis, hirtis. *Gracilis*,

E. imbecilla. *Hortulanis.*

Caulis quamvis gracilis recte attollitur, minime imbecillis.

E. caule tenui: foliis verticillis remotis: corollâ $1\frac{1}{2}$—2-lineari; tubo ovato-cylindraceo, ore lato: pericarpio hirto. *Intervallaris*,

E. elongata. *Roxb. MS.*

Species pulcherrima, ramulo fere omni floribus parvis, rubris, oblongis, nutantibus onuſto.

E. caule glabro: corollâ $1\frac{1}{4}$-lineari; tubo poculiformi; limbo erecto: calcaribus lanceolato-cuneatis, integerrimis. *Quadræflora*,

E. quadrangularis. *Prodr. p.* 297.

Sponte

Sponte nafcentem in *Hottentots Holland,* legit I. Mulder. Flores inconfpicui, fed in vafto genere diftinctiffimi.

Prolifera. E. caule hirfuto: corollâ $1\frac{1}{2}$-lineari; tubo cyathiformi; limbi interftitiis acutis: calcaribus rectis: pericarpio hirto.

E. caffra. *Andr. Er. n.* 50. *cum Ic.* E. ftrigofa. *Wendl. Er. fafc.* 2. *p.* 25. *cum Ic.* E. ftrigofa. *Willd. Sp. Pl. v.* 2. *p.* 365. fynonymo et defcriptione exclufis. E. perfoluta 2. *Thunb. Diff. n.* 62. E. perfoluta. *Linn. Mant. p.* 230. E. perfoluta. *Linn. Diff. n.* 16. *cum fig. floris.* E. fubdivaricata. *Berg. Pl. Cap. p.* 114.

Florefcentiâ peractâ, rami plerumque e centro florum ultra producuntur.

Cyathiformis, E. pedunculis glabris: corollâ $1\frac{1}{2}$-lineari; tubo cyathiformi; limbi interftitiis acutis: calcaribus falcatis.

E. lævis. *Hortulanis.*

Valde affinis fequenti, antheris pene ad amuffim refpondentibus: ob limbi interftitia tamen ægre varietatem effe concedam.

Pelviformis. E. pedunculis rare pubefcentibus: corollâ $1\frac{1}{2}$-lineari; tubo pelviformi; limbi interftitiis bafi ovalibus: calcaribus falcatis.

E. perfoluta. *Curt. in Bot. Mag. n.* 342. E. perfoluta 1. *Thunb. Diff. n.* 62. E. viridi-purpurea. *Linn. Diff. n.* 9. *cum fig. floris.* auctoritate ipfius fpeciminis. E. mauritanica. *Linn. Syft. Nat. ed.* 10. *p.* 1002.

Variat floribus albis, purpureis.

E. foliis

E. foliis anguſtis: calyce recurvo-horizontali: corollâ 2-lineari; tubo hemiſphærico; laciniis baſi imbricatis. *Turrigera,*
E. cupreſſina. *Hortulanis.*
Foliorum laminæ pene enerves videntur.

E. foliis latis: calyce reclinato-deflexo: corollâ $2\frac{1}{3}$-lineari; tubo late ovato: limbi interſtitiis baſi ovatis. *Lacunæflora,*
E. Bergiana. *Wendl. Er. faſc.* 2. *p.* 29. *cum Ic.* E. quadriflora. *Willd. Sp. Pl. v.* 2. *p.* 379. E. Bergiana. *Schneev. Pl. n.* 46. *cum Ic.* E. Bergiana. *Linn. Mant. p.* 235. E. Bergiana. *Linn. Diſſ. n.* 6. *cum fig. floris,* peſſimâ.
Foliorum Laminæ evidenter 1-nerviæ.

E. bracteis minutiſſimis: calyce incurvo-deflexo: corollâ 2-lineari; tubo globoſo; laciniis baſi imbricatis. *Florida.*
E. florida. *Thunb. Diſſ. n.* 64.
In hac Calcaria lanceolata.

E. caule glabro: corollâ $1\frac{1}{2}$-lineari, lævi; tubo turbinato, 8-angulo; limbo incurvo: calcaribus auricularibus, glabris. *Turbiniflora,*
Communicavit *Hibbert.*
Flores pallide purpurei.

E. caule viſcidulo: corollâ $1\frac{1}{3}$-lineari; tubo ſphærico, valde 8-angulo: limbo recurvo-erecto: pericarpio hirto. *Bullularis,*

E. granulata. *Linn. Mant. p.* 234. E. ramentacea. *Linn. Mant. p.* 65. E. multumbellifera. *Berg. Pl. Cap. p.* 110. E. pilulifera. *Berg. Pl. Cap. p.* 111.

Mucoſa, E. caule glabro: corollâ 2-lineari, viſcidâ; tubo plus minus obovato; limbi interſtitiis parum tumidis.

E. mucoſa. *Pl. Kew. t.* 15. bona. E. mucoſa. *Linn. Mant. p.* 232. E. ferrea. *Berg. Pl. Cap. p.* 112.

Folia mire ludunt; laminis linearibus, lineari-lanceolatis, vel etiam ovalibus.

Piluliformis, E. foliis ſparſis: corollâ 2½-lineari, lævi; tubo longitudine calycis: calcaribus lineari-attenuatis: pericarpio lævi.

E. nudicaulis. *Berg. Pl. Cap. p.* 113. E. pilulifera. *Linn. Sp. Pl. ed.* 2. *p.* 507.

Foliorum Laminæ reduplicaturâ minute ciliatæ.

Obliqua, E. foliis oblique verticillatis: ſpicis coarctatis: corollâ 3½-lineari, viſcidâ; limbi interſtitiis in uncum tumidis.

E. obliqua. *Pl. Kew. t.* 3. optima. E. obliqua. *Thunb. Diſſ. n.* 73. *cum Ic.* bonâ.

Flores pallide purpurei.

Sequax, E. foliis teneris glutine arachnoideis: faſciculis 4—6-floris: corollâ 3—4-lineari, viſcidâ; limbi interſtitiis in uncum tumidis.

Variat α: Corolla 3-linearis; tubo late ovato.

E. phyſodes. *Thunb. Diſſ. n.* 89. E. phyſodes.

ſodes. *Linn. Diſſ. n.* 32. *cum fig.* E. phyſodes. *Berg. Pl. Cap. p.* 101. E. phyſodes. *Linn. Sp. Pl. ed.* 2. *p.* 506.

β: Corolla 4-linearis; tubo ovato.
E. phyſodes. *Andr. Er. n.* 44. *cum Ic.* E. phyſodes. *Curt. Bot. Mag. n.* 443. *cum Ic.*

Semina immatura tuberculata, poſtea tuberculis depreſſis evidenter ſcrobiculata.

E. foliorum laminis ovato-cuneatis: corollâ 4—5-lineari, viſcidâ; tubo urceolari; laciniis baſi imbricatis: filamentis latiſſimis. *Blenna.*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Pulchra ſpecies, corollis luteis ore viridi.

E. foliis 4-nis: ſpicis coarctatis: corollâ $2\frac{1}{2}$-lineari, lævi; tubo amphoræformi; limbo crenulato. *Verecunda.*

E. cernua. *Andr. Er. n.* 48. *cum Ic.*

Flores pallide carnei.

E. corollâ 2-lineari, glabra; tubo urceolari, parum 4-gono: calcaribus cuneatis, hirſutis: antheris hirſutis. *Pulchella.*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Facies aliqua *Galiifloræ*, ſed veram ejus affinitatem adhuc neſcio.

E. foliorum laminis lineari-lanceolatis: ſpicis coarctatis: corollâ 4-lineari; tubo ſuperne admodum ventricoſo: antheris exſertis. *Embothrii-folia,*

Communicavit *Hibbert.*

Nomen aptius e ſingulari figurâ corollæ forſan excogitandum: ſpecimen ſiccum tantum vidi.

Glutinoſa, E. foliis ſparſis: ſpicis coarctatis: corollâ 3—5-lineari, viſcidâ; tubo ovato-pyramidali: calcaribus auricularibus.

Variat α: Corolla 3-linearis.

E. glutinoſa. *Pl. Kew. t.* 17. optima. Chamæciſtus roris ſolis foliis. *Pet. Muſ. p.* 22. *t.* 161.

β: Corolla 5-linearis.

E. Droſeroides. *Andr. Er. n.* 30. *cum Ic.* E. glutinoſa. *Thunb. Diſſ. n.* 48. Andromeda droſeroides. *Linn. Mant. p.* 239. E. glutinoſa. *Berg. Pl. Cap. p.* 98. auctoritate ejus ſpeciminis.

Hujuſce generis eſt proculdubio, nec, quicquid ſuadeat Habitus, ad *Andromedam* referenda.

Curvifolia. E. foliis ternis: laminis recurvis: ſpicis coarctatis: corollâ 4-lineari, viſcidâ; tubo ovato-pyramidali: calcaribus lineari-attenuatis.

Sponte naſcentem in *Hottentots Holland,* legit I. Mulder.

Pericarpium minutiſſime hirtum.

Squarroſa, E. corollâ 5—6-lineari, viſcidâ: tubo ovato-pyramidali; limbo obtuſo: calcaribus marginalibus: antheris lævibus.

Sponte

Sponte nafcentem in *Lange Kloof*, legit F. Maffon.
Folia denfiffima.

E. corollâ 8—11-lineari, vifcidâ; tubo ovato-pyramidali; limbo acuto: filamentis muticis: antheris lanatis. *Gorteriæfolia*,

Variat α: Corolla 8—9-linearis.
In hac Tubus pene totus albus.

β: Corolla 10—11-linearis.
E. retorta. *Curt. Bot. Mag. n.* 362. *cum Ic.* E. retorta. *Andr. Er. n.* 15. *cum Ic.* E. retorta. *Thunb. Diff. n.* 91. E. retorta. *Linn. Suppl. p.* 220. E. retorta. *Montin. in Act. Holm.* 1774. *p.* 297. *t.* 7.

Herba fimpliciter recurva: diverfiffimam directionem exprimit nomen auctorum, quam in Ordine Naturali *Graminum* aliquando videas.

E. foliorum laminis lanceolato-cuneatis: corollâ 8—10-lineari, vifcidâ; tubo ampullæformi; limbo obtufo. *Ampullæformis*,

E. ampullacea. *Andr. Er. n.* 34. *cum Ic.* E. ampullacea. *Curt. Bot. Mag. n.* 303. *cum Ic.* bonâ.

In hac cohorte, Antheræ apicibus incurvis et valde attenuatis confimiles, fere dabunt characterem.

E. foliorum laminis ovato-cuneatis: corollâ 9—11-lineari, vifcidâ; tubo late ampullæformi; limbo retufo. *Capax*,

E. prægnans. *Soland. MS.*

Sponte nafcentem in *Hottentots Holland*, legit F. Maffon.

E. foliis

Lagenæformis, E. foliis 3-nis: corollâ 12—14-lineari, viſcidâ; tubo ovato apice ventricoſo; limbo tubo 4-plo breviore, ovato.

E. jaſminiflora! *Andr. Er. n.* 49. *cum Ic.* mediocri.

Sponte naſcentem in *Platte Kloof,* locis humidis, legit F. Maſſon.

Jaſminiflora. E. foliis 3-nis: corollâ 16—19-lineari, viſcidâ; tubo cylindraceo apice ventricoſo; limbo tubo 3-plo breviore, ovali.

E. Aitonia. *Curt. Bot. Mag. n.* 429. *cum Ic.* E. Aitonia. *Andr. Er. n.* 21. *cum Ic.* malâ. E. Jaſminiflora. *Prodr. p.* 293.

Flos ad amuſſim Jaſmini Grandiflori, *Linn.*

Pavettæflora, E. pedunculis breviſſimis: corollâ 9—10-lineari; limbo intus farinoſo: filamentis juxta apicem antheræ calcaratis.

E. infundibuliformis. *Roxb. MS.*

Communicavit *Hibbert*: ſplendidum donum, ejus nomine, ſi talia admittere potuiſſem, certe condecorandum. Calcaria etiam in hac potius e filamento, quam ipſâ antherâ, exſeruntur.

Faſciformis, E. pedunculis breviſſimis: corollâ 5—6-lineari; limbo intus farinoſo: filamentis muticis: antheris rectis.

E. faſtigiata. *Thunb. Diſſ. n.* 37. E. faſtigiata. *Linn. Diſſ. n.* 44. *cum fig. floris.* E. faſtigiata. *Linn. Mant. p.* 66.

Sponte naſcentem in *Platte Kloof,* legit F. Maſſon.

E. calyce minute ciliato: corollâ 5—6-lineari; tubo anguſte cylindraceo-urceolari; limbo breviſſimo; filamentis muticis. *Fiſtulæflora*,

E. cylindrica. *Thunb. Diſſ. n.* 39.

Pericarpium obovatum, glabrum.

E. caule glabro: corollâ 3-lineari; tubo anguſte pyramidali baſi planâ: calcaribus ſemilanceolatis: pericarpio obpyramidali. *Fragrans*,

E. Muſcari. *Andr. Er. n.* 1. *cum Ic.* mediocri.

Sponte naſcentem juxta torrentem in *Zout Rivier*, legit F. Maſſon.

E. caule pubeſcente: corollâ 2½-lineari; tubo ovato-pyramidali: calcaribus auricularibus: pericarpio ſphærico. *Galiiflora*,

Variat α: Corolla albida.

E. tranſparens. *Berg. Pl. Cap. p.* 108.

β: Corolla rubra.

E. comoſa. *Pl. Kew. t.* 18. mala. E. comoſa. *Thunb. Diſſ. n.* 38. E. comoſa. *Linn. Diſſ. n.* 48. *cum fig. floris*. E. comoſa. *Linn. Mant. p.* 234.

Vox comoſus, prout uſurpatur apud Botanicos, in hanc ſpeciem minime quadrat.

E. caule pubeſcente: calyce obcuneato, ſerrato: corollâ 3-lineari; limbo tubo ½-breviore: calcaribus minutiſſimis, auricularibus. *Nidiflora*,

E. denticulata. *Roxb. MS.*

In

In hortis quoque confunditur cum ſequente, cui ſimilis: vix tamen pro varietate habenda, ob filamenta calcarata, et foramina antherarum breviora.

Denticularis, E. caule pubeſcente: calyce obcuneato, ſerrato: corollâ 3-lineari; limbo tubo ½-breviore: antheris longe foraminoſis.

E. dentata. *Thunb. Diſſ. n.* 39. E. denticularis. *Linn. Mant. p.* 22. auctoritate ſpeciminis ex Herbario Bergiano.

Flores purpurei.

Pulchra, E. caule glabro: calyce anguſte lanceolato, ſerrato: corollâ 4—5-lineari; limbo tubo duplo breviore: antheris breviter foraminoſis.

E. Walkeria. *Andr. Er. n.* 45. *cum Ic.* bonâ.

Daphniflora, E. calyce ovato-cuſpidato, vix ſerrato: corollâ 3-lineari; limbo tubo duplo breviore, recurvo-deflexo: filamentis muticis.

Sponte naſcentem in *Hottentots Holland,* legit I. Mulder.

Pellucida. E. caule gracili: calyce ſpatulato, ſerrato: corollâ 5—6-lineari; limbo tubo triplo breviore; filamentis muticis.

E. pellucida. *Soland. MS.*

Sponte naſcentem in *Hottentots Holland,* ſolo humido, legit F. Maſſon.

Caulis faſtigiatus, verticillis foliorum, in ramis vegetioribus, remotis. Foliorum Laminæ anguſtæ, lineari-

 attenuatæ.

attenuatæ. Corolla albida cum rubore aliquo, ita pellucida, ut literas tubo explanato ſubjectas facile diſtinguas.

E. bracteis duabus: corollâ 5—6-lineari; tubo ovato-pyramidali; limbo breviſſimo: calcaribus longiſſimis, ſubulatis. *Amabilis.*

E. inflata. *Thunb. Diſſ. n.* 67. *cum Ic.*

Species apud nos adhuc rariſſima.

E. bracteis duabus: corollâ 6—7-lineari; tubo ovato-pyramidali apice ventricoſulo: calcaribus breviſſimis, auricularibus. *Venuſta.*

E. ventricoſa. *Wendl. Er. faſc.* 3. *p.* 11. *cum Ic.* malâ. E. ventricoſa. *Curt. Bot. Mag. n.* 350. *cum Ic.* E. ventricoſa. *Andr. Er. n.* 2. *cum Ic.* E. ventricoſa. *Thunb. Diſſ. n.* 36. *cum Ic.*

Sponte naſcentem juxta *Franſche Hoek,* legit F. Maſſon.

E. foliis 2-nis: calyce 1½-lineari, anguſte ovato-cuneato: corollâ 2½-lineari; tubo ovato-pyramidali: pericarpio obovato. *Imbellis,*

Variat α: Corolla albida.

β: Corolla pallide lutea.

γ: Corolla lutea.

E. lutea. *Wendl. Er. faſc.* 1. *p.* 13. *cum Ic.* E. lutea. *Andr. Er. n.* 11. *cum Ic.* E. lutea. *Thunb. Diſſ. n.* 49. E. lutea. *Linn. Diſſ. n.* 2. *cum fig. floris.* E. lutea. *Linn. Mant. p.* 234. E. lutea. *Berg. Pl. Cap. p.* 115.

Corollæ Laciniæ æquales ſunt: inæquales, ut deſcribit Willdenow, in toto genere haud ferme invenias.

Linifolia, E. foliis 2-nis: calyce $1\frac{1}{2}$-lineari, late ovali-acuminulato: corollâ 2-lineari; tubo ovato: pericarpio turbinato.

Variat α: Corolla pallidiſſime rubra.

E. foliis lanceolatis oppoſitis imbricatis, &c. *Linn. Hort. Cliff. p.* 148.

β: Corolla læte rubra.

E. tenuifolia. *Linn. Diſſ. n.* 33. *cum fig. floris.* E. tenuifolia. *Berg. Pl. Cap. p.* 116. E. tenuifolia. *Linn. Sp. Pl. ed.* 2. *p.* 507. E. africana, altera, &c. *Seb. Theſ. v.* I. *p.* 157. *t.* 73. *f.* 6.

Filamenta, æque ac in Imbelli, calcarata.

Borboniæ-folia. E. foliis 2-nis: calyce $3\frac{1}{2}$-lineari, late ovali-acuminulato: corollâ $3\frac{1}{2}$-lineari; tubo ovato: pericarpio obovato.

Communicavit *Hibbert.*

Haſce tres, foliis 2-nis, puras legitimaſque eſſe ſpecies, minime pro certo affirmarem: calycis enim proportio, in quibuſdam aliis admodum variabilis.

Corifolia, E. calyce reclinato-patente: corollâ $1\frac{1}{2}$-lineari, calyci plus minus æquali; tubo urceolari; laciniis acutis.

E. articularis. *Curt. Bot. Mag. n.* 423. *cum Ic.* E. calycina. *Andr. Er. n.* 17. *cum Ic.* E. corifolia. *Thunb. Diſſ. n.* 77. E. corifolia. *Linn. Diſſ. n.* 26. *cum fig. floris tenelli,* peſſimâ. E. articularis. *Linn. Mant. p.* 65.

An ſit Corifolia *Sp. Pl. ed.* 2. ſolum ab Herbario Burmanniano diſcendum.

Obvallaris, E. bracteis grandibus, obovatis, ſupra medium pedunculi: corollâ 2-lineari; laciniis totis crenulatis.

E. bracteata,

E. bracteata. *Thunb. Diss. n.* 3.

Sponte nascentem ad *Platte Kloof* montibus, legit C. P. Thunberg.

Filamenta certe calcarata.

E. foliorum laminis pube densâ ciliatis: corollâ 2-lineari, versus apicem hirtâ; laciniis crispis, retusis. *Hyssopifolia.*

E. pigra. *Soland. MS.*

Sponte nascentem juxta *Baay Fals*, legit G. Robertson.

Bracteæ tantummodo duæ, ut in omnibus hujus cohortis: vicem tertiæ supplet folium pedunculo subjectum, dilatatum, et plerumque coloratum.

E. foliorum laminis reclinatis, acute mucronatis: corollâ 3-lineari; laciniis ovato-cuneatis, 2-fidulis. *Taxifolia.*

E. taxifolia. *Wendl. Er. fasc.* 2. *p.* 19. *cum Ic.* E. taxifolia. *Pl. Kew. t.* 19.

Calcaria in hac recte delineavit *Wendland:* hinc ab alio auctore ejus differentiam specificam, quæ antheras muticas sistit, concinnatam fuisse suspicor.

E. floribus in rudimentis axillaribus: calyce cuspidato, longe ciliato: corollâ 4-lineari, pyramidali: antheris a medio foraminosis. *Pugionifolia.*

E. tetragona. *Thunb. Diss. n.* 5. *cum Ic.*

Flores lutei.

E. floribus in rudimentis axillaribus: calyce acuminato: corollâ 3-lineari, ovatâ: antheris juxta apicem foraminosis. *Viminalis.*

E. albens. *Curt. Bot. Mag. n.* 440. *cum Ic.* E. albens. *Linn. Diff. n.* 34. *cum fig. floris.* E. albens. *Linn. Mant. p.* 231.

Flores ochroleuci.

Paucula nunc in vacuo chartæ fpatiolo, de noftris nominibus, inferere liceat. Satis fcio, his temporibus periculum quid novandi: etiam doctiffimos Botanicos, qui nullum, quantumvis licet abfurdum vocabulum, quod ipfi non antea irrifui damnaverint, mutari patiuntur. Tantis viris, me nil contra rationem unquam mutaffe, modo refpondeam: quibus autem hortulanorum gentis prudentiffimæ nomina adulatoria magis placeant, omnibus iftis religiofe a me citatis, prout cuique libido eft, utantur.

XXV. *Ex-*

J. Macculloch del.t 1800.

XXV. Extracts *from the* Minute Book *of the Linnean Society.*

April 7, 1801. AN account was laid before the Society, from Dr. Macculloch, F. L. S. of an artifice uſed by the *Cancer Phalangium* to enſnare its prey. This contrivance conſiſts in the inſect dreſſing itſelf up, as it were, in fragments of a *Fucus* (the narrow-leaved variety of Hudſon's *ciliatus*), which it ſeems to cut off, and to attach to the long hairs of its body and legs by means of a glutinous ſubſtance. It thus imitates a perfect plant of that *Fucus* ſo accurately as to have deceived Dr. Macculloch. See Tab. XXXI.

Oct. 6. L. W. Dillwyn, Eſq. F. L. S. ſent information of his having diſcovered the *Syſimbrium murale* of Linnæus (a plant not hitherto noticed as of Britiſh growth) growing wild abundantly on the pier at Ramſgate and other places thereabouts. He believes it to be rather common throughout the iſle of Thanet.

Dec. 1. A letter from Dr. Walter Wade, of Dublin, A. L. S. to the Preſident, mentions his having found the *Eriocaulon ſeptangulare*, *Engl. Bot. v.* 11. *t.* 733, in Ireland. It has never before been ſeen but in the Iſle of Skye. Dr. Wade obſerved it laſt September, decorating the edges of all the lakes, great and ſmall, in the romantic mountainous diſtrict of Cunnamara, in the county of Galway. He remarked the number of angles in the ſtem to vary from 6 to 10, though moſt frequently

frequently 7, and that the generic and ſpecific characters accorded with thoſe given in *Engl. Bot.*

Dec. 15. Information was given that the late Dr. Pulteney, F. R. S. and L. S. had ordered his very valuable Muſæum of Natural Hiſtory to be preſented to the Society, on condition of its being preſerved as a ſeparate collection, in his name; and that he had alſo bequeathed to the Society the ſum of two hundred pounds ſtock, in the three per cent. conſolidated annuities.

CATA-

CATALOGUE

OF THE

LIBRARY OF THE LINNEAN SOCIETY,

Continued from Page 293 of Vol. V. of the Society's Transactions.

N. B. To Books which are Continuations of Works contained in the former Part of the Catalogue the original Numbers are here affixed; and the other Books are numbered in regular Progression.

459. ACHARII (E.) Prodromus Lichenographiæ Sueciæ. Lincopiæ, 1798, 8vo.
17. Barton's (B. S.) Supplement to a Memoir concerning the fascinating Quality of the Rattle-Snake, and other American Serpents. 8vo.
35. Blumenbach (J. F.) Abbildungen Naturhistorischer Gegenstände. 5 tes heft. Göttingen, 1800, 8vo.
460. ———————— Ueber die Zauberkraft der Klapper-Schlange. 8vo.
461. Clairville ( ) Entomologie Helvétique, vol. 1. Zuric, 1798, 8vo.
462. Columnæ (F.) Phytobasanus. Mediolani, 1744, 4to.
463. Comparetti (A.) Observationes Dioptricæ et Anatomicæ Comparatæ de Visu et Oculo. Patavii, 1798, 4to.
464. Davy's (H.) Syllabus of a Course of Lectures on Chemistry at the Royal Institution. Lond. 1802, 8vo.
465. Donn's (J.) Hortus Cantabrigiensis, ed. 2. Cambridge, 1800, 8vo.

466. Donovan's (E.) Epitome of the Natural Hiſtory of the Inſects of India, No. 1 to 7 Lond. 1800—2, 4to.

80. Dryander (J.) Catalogus Bibliothecæ Hiſtorico-Naturalis Joſephi Banks, tomus 5. Londini, 1800, 8vo.

467. Fabri (J. M.) Strychnomania. Aug. Vindel. 1677, 4to.

468. Forſter (G.) Herbarium Auſtrale. Gottingæ, 1797, 8vo.

469. Freieſleben (J. C.) Ueber das ſchillernde Foſſil, von der Baſte bey Harzburg. Leipzig, 1794, 8vo.

470. Garnett's (T.) Annals of Philoſophy for 1800. London, 1801, 8vo.

471. ———— Outlines of a Courſe of Lectures on Chemiſtry at the Royal Inſtitution. London, 1801, 8vo.

472. Graſſo (J. P.) Diſſ. inaug. de Lacerta agili. Helmſtadii, 1788, 4to.

473. Grönwall (A.) Præſide Diſſ. de Ferro Suecano Oſmund. Upſal. 1725, 4to.

474. Hatchett's (C.) Chemical Experiments on Zoophytes. From the Philoſophical Tranſactions, 4to.

475. ———— Analyſis of a Mineral Subſtance from North America, containing a Metal hitherto unknown. From the Philoſophical Tranſactions, 4to.

476. Hoſack's (D.) Syllabus of a Courſe of Lectures on Botany, delivered in Columbia-College. New York, 1795, 8vo.

477. Hudſon's (W.) Flora Anglica, ed. 2. Lond. 1778, 8vo.

478. Hutchinſon's (J.) Natural Hiſtory of the Frog Fiſh of Surinam. York, 1797, 4to.

479. Lamarck (J. B.) Syſtême des Animaux ſans Vertebres. Paris, 1801, 8vo.

480. ————Encyclopédie Méthodique, Botanique, tome 1—3. Paris, 1789, 4to.

481. Langer (J. H. S.) Mineralogiſche Geſchichte der Hochſtifter Paderborn, und Hildesheim. Leipzig, 1789, 8vo.

482. Laſpeyres (J. H.) Seſiæ Europeæ. Berol. 1801, 4to.

161. Latham's (J.) Supplement 2d to the General Synopſis of Birds. London, 1802, 4to.

483. Latreille (P. A.) Hiſtoire des Salamandres de France. Paris, 1800, 8vo.

484. Linnæi (C.) Fauna Suecica. Holmiæ, 1746, 8vo.

485. ———— Syſtema Naturæ, ed. 9. Leyd. 1756, 8vo.

486. Ludwig (C. F.) Erſte Aufzählung der bis jezt in Sachſen entdeckten Inſekten. Leipzig, 1799, 8vo.

487. Markwick's (W.) Deſcriptions and Figures of Graſſes. MS. folio.

488. ———— Remarks on Britiſh Birds. MS. 4to.

302. Martyn's (Tho.) Gardener's and Botaniſt's Dictionary, by the late Philip Miller, corrected and newly arranged, with Additions. Part 14—16.

489. Maſtin's (J.) Hiſtory of Naſeby. Cambridge, 1792, 8vo.

490. Mikan (J. C.) Monographia Bombyliorum Bohemiæ. Pragæ, 1796, 8vo.

491. Millin (A. L.) Obfervations fur les Manufcrits de Diofcorides. 8vo.
492. ——————— Introduction à l'Etude des Pierres gravées. 8vo.
493. ———————Differtation fur quelques Medailles des Villes Grecques qui offrent la Repréfentation d'Objets relatifs à l'Hiftoire Naturelle. 8vo.
494. ——————— Notice hiftorique fur J. H. Eckhel. 8vo.
495. Montagu's (G.) Ornithological Dictionary, or Alphabetical Synopfis of Britifh Birds, 2 vols. London, 1802, 8vo.
496. Pears' (C.) Cafes of Phthifis Pulmonalis fuccefsfully treated on the Tonic Plan. London, 1801, 8vo.
497. Pennant's Journey from London to the Ifle of Wight, 2 vols. London, 1801, 4to.
498. Raji (J.) Synopfis Methodica Animalium Quadrupedum, et Serpentini Generis. Lond. 1693, 8vo.
499. ———— Synopfis Methodica Stirpium Britannicarum, ed. 3. Lond. 1724, 8vo.
500. ———— Hiftoria Plantarum, tom. 1 et 2. Londini, 1686—88, fol.
501. Van Rheede (H. A.) Hortus Indicus Malabaricus, tomi 12. Amftelod. 1678—1703, fol.
502. Rofenmüller (J. C.) de Offibus Foffilibus Animalis cujufdam. Lipfiæ, 1794, 4to.
346. Roxburgh's (W.) Plants of the Coaft of Coromandel, vol. 2, parts 2 and 3.
503. ——————— Account of the Chermes Lacca. From the Phil. Tranf. 4to.
504. Ruffel's (P.) Account of the Tabafheer. From the Phil. Tranf. 4to.
505. Salifbury (R. A.) Icones Stirpium rariorum, Defcriptionibus illuftratæ, No. 1 & 2, fol.
506. Sarti (G.) Analifi Chemica delle Acqui dei Bagni Pifani.
507. Schachmann (C. G. A. von) Beobachtungen über das Gebirge bey Königfhayn. Drefden, 1780, 4to.
508. Scheuchzer (J. J.) de Helvetiæ Aëribus, Aquis, Locis. Tiguri, 1728, 4to.
509. Schütz (A. G.) Befchreibung einiger Nordamerikanifchen Foffilien. Leipzig, 1791, 8vo.
510. Schwägrichen (C. F.) Topographiæ Botanicæ et Entomologicæ Lipfienfis Specimen 1. Lipfiæ, 1799, 4to.
511. Shaw's (G.) General Zoology, vols. 1—3. Lond. 1800—1802, 8vo.
512. Sinclair's (Sir John) Hints on Longevity. 4to.
513. Slevogtii (J. H.) Prolufio de Aftrantiæ Charactere. Jenæ, 1721, 4to.
514. Smith (J. E.) Flora Britannica, vol. 1. & 2. Londini, 1800, 8vo.
515. ——————— Compendium Floræ Britannicæ. Londini, 1800, 8vo.
377. Smith and Sowerby's Englifh Botany, vol. 10 to 14. London 1800—2, 8vo.
516. Stacey's (H. P.) Obfervations on the Failure of Turnip Crops. London, 1800, 8vo.
517. Strange, fopra l'Origine della Carta Naturale di Cortona. Pifa, 1764, 4to.
518. Stromeyer (F.) Hiftoriæ Vegetabilium Geographicæ Specimen. Gottingæ, 1800, 4to.

519. Thunberg (C. P.) Beskrifning på Svenska Djur. 1 Classen, om Mammalia. Upsala, 1798, 8vo.

—— Dissertationes Academicæ. Upsaliæ, 4to.

399. Museum Naturalium Academiæ Upsaliensis, Partes 19—22. Append. 4—7.

405. Genera Plantarum Nova, Partes 8 & 9.

520. De Drosera. 1797.

521. De Melanthio. 1797.

522. Ventenat (E. P.) Tableau du Regne Vegetal. Paris, an. 7. tomes 4. 8vo.

523. Villars Histoire des Plantes de Dauphiné. Grenoble, 1786, tomes 3 en 4 vols. 8vo.

524. Weigel (C. E.) Vom Nuzen der Botanik. Greifswald, 1773, 4to.

525. White's (Gilbert) Works in Natural History, with a Calendar and Observations by W. Markwick, Esq. 2 vols. London, 1802, 8vo.

526. Young's (T.) Syllabus of a Course of Lectures on Natural and Experimental Philosophy at the Royal Institution. London, 1802, 8vo.

438. Philosophical Transactions of the Royal Society of London, for 1800. London, 4to.

527. Transactions of the Royal Society of Edinburgh, vol. 5. part 1. Edin. 1799, 4to.

439. Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce, vols. 17, 18, 19. Lond. 8vo.

528. Asiatic Researches, vol. 1—6. Calcutta, 1788—1799, 4to.

440. Memoirs of the Literary and Philosophical Society of Manchester, vol. 5.

529. Philosophical Transactions abridged, vol. 1—7. London, 1721—1734, 4to.

530. Journals of the Royal Institution, No. 1—7. 8vo.

531. Prodromus Lepidopterorum Britannicorum, by a Fellow of the Linnean Society Holt, 1802, 4to.

532. Termini Botanici. Edinburgi, 1770, 8vo.

533. Conspectus Horti Botanici Jenensis. Jenæ, 1795, 4to.

LIST

LIST OF DONORS

TO THE

LIBRARY OF THE LINNEAN SOCIETY,

With References to the Numbers in the foregoing Catalogue of the Books presented by them respectively.

THE Royal Society of London, 438.

The Managers of the Royal Institution, 464. 526. 530.

The Society for the Encouragement of Arts, Manufactures, and Commerce, 439.

The Literary and Philosophical Society of Manchester, 440.

The Royal Society of Edinburgh, 527.

The Asiatic Society, 528.

Erik Acharius, M. D. 459.

The Right Honourable Sir Joseph Banks, Bart. K. B. H. M. L. S. 35. 460. 463. 80. 468. 469. 472. 473. 480. 481. 486. 489. 490. 500. 502. 503. 504. 506—510. 513. 517. 522—524. 532. 533.

Benjamin Smith Barton, M. D. F. M. L. S. 17.

Mr. Anthony Carlisle, F. L. S. 467.

M. Clairville, 461.

Rev. John Davies, F. L. S. 465.

Mr. Edward Donovan, F. L. S. 466.

Jonas Dryander, M. A. V. P. L. S. 346.

Edward Forster, Jun. Esq. F. L. S. 499.

Thomas

Thomas Garnett, M. D. F. L. S. 471.

Thomas Garnett, M. D. F. L. S.
and
Mr. Benjamin Price, } 470.

Charles Hatchett, Esq. F. L. S. 474. 475.

David Hosack, M. D. F. L. S. 476.

Mr. Frederick Kanmacher, F. L. S. 477.

M. J. B. Lamarck, de l'Institut de France, 479.

M. J. H. Laspeyres, F. M. L. S. 482.

John Latham, M. D. F. L. S. Romsey, 162.

M. P. A. Latreille, F. M. L. S. 483.

Alexander MacLeay, Esq. Sec. L. S. 484.

William Markwick, Esq. F. L. S. 487. 488.

Thomas Marsham, Esq. Tr. L. S. 485.

Rev. Thomas Martyn, B. D. F. L. S. 302.

M. A. L. Millin, F. M. L. S. 491—494.

George Montagu, Esq. F. L. S. 495.

Mr. C. Pears, F. L. S. 496.

David Pennant, Esq. F. L. S. 497.

Richard Anthony Salisbury, Esq. F. L. S. 505.

George Shaw, M. D. V. P. L. S. 511.

Sir John Sinclair, Baronet, M. P. 512.

James Edward Smith, M. D. P. L. S. 514. 515.

Mr. James Sowerby, F. L. S. 377.

Rev. H. P. Stacey, LL. B. 516.

F. Stromeyer, M. D. of Gottingen, 518.

Mr. Robert Teesdale, F. L. S. 478.

Car. Pet. Thunberg, M. D. F. M. L. S. 519. 399. 405. 520. 521.

Mr. John White, 525.

Thomas Jenkinson Woodward, LL. B. F. L. S. 498.

Thomas Young, M. D. F. L. S. 462. 529.

The Anonymous Author, 531.

END OF THE SIXTH VOLUME.

Printed by Taylor and Wilks, Chancery Lane.